

IRP Activities
Meeting on May 7, 1991

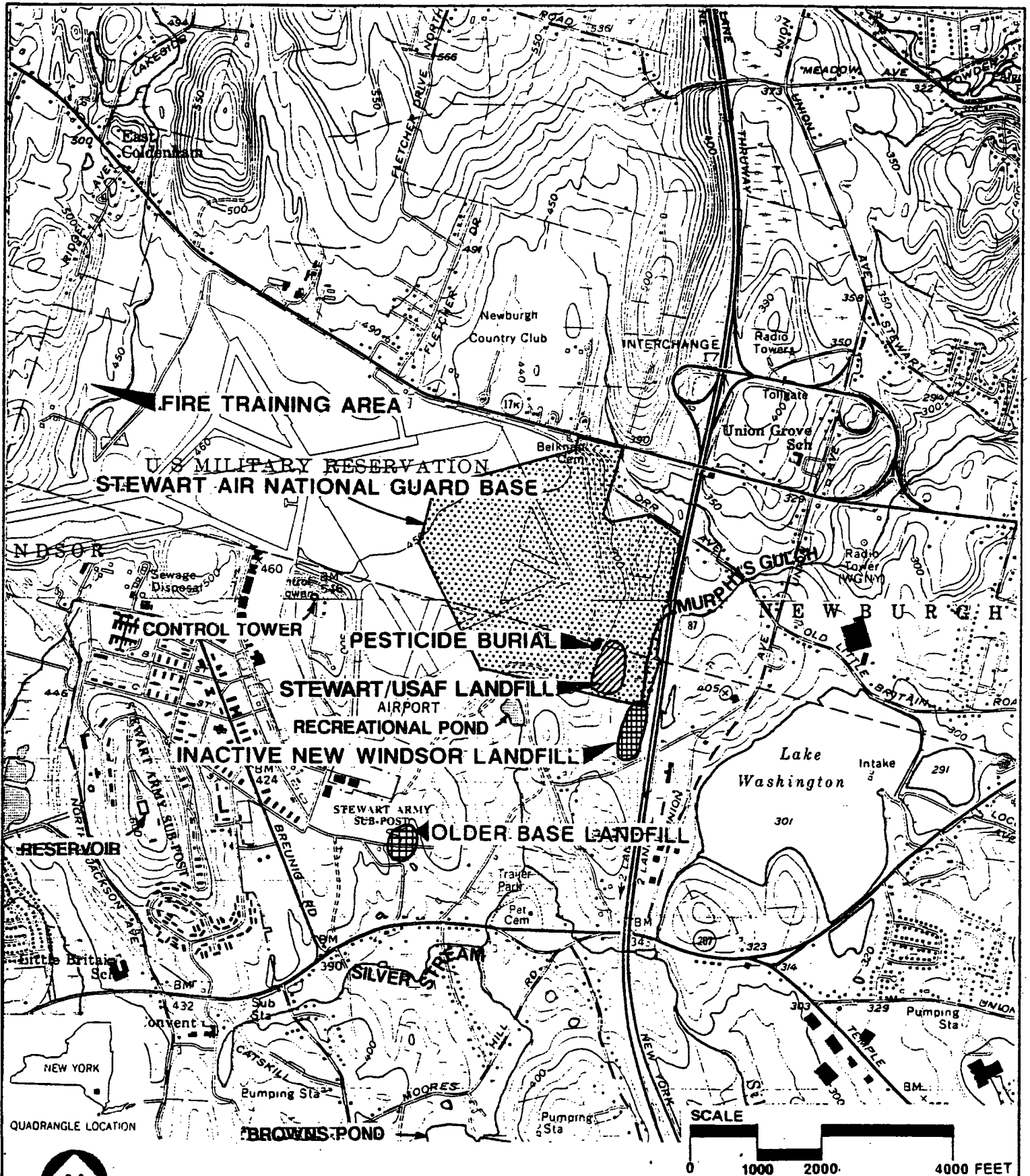
Stewart Air National Guard Installation
Newburgh, New York

Agenda

- I. Former Base Landfill - Site Inspection Report**
- II. Former Base Landfill - Decision Document**
- III. Pesticide Pit Burial Area - History**
- IV. Pesticide Pit Burial Area - Plans for Remedial Investigation**



I. FORMER BASE LANDFILL - SITE INSPECTION REPORT



SOURCE: U.S.G.S. NEWBURGH
AND CORNWALL, NEW YORK
QUADRANGLES (1957).
7.5 MINUTE SERIES

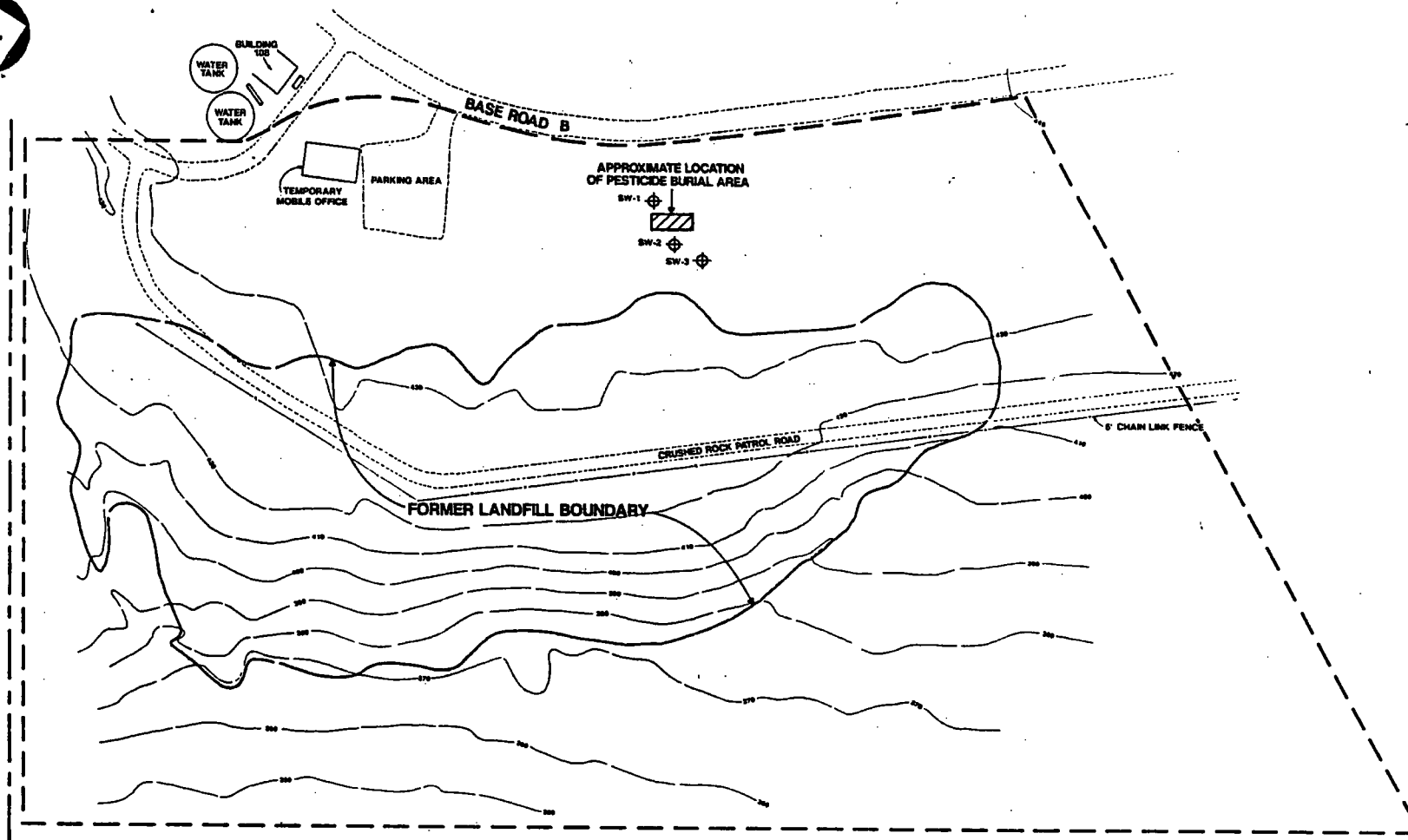
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INSTALLATION RESTORATION PROGRAM
STEWART AIR NATIONAL GUARD BASE, N.Y.







AREA LOCATION MAP

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FIGURE 1-2



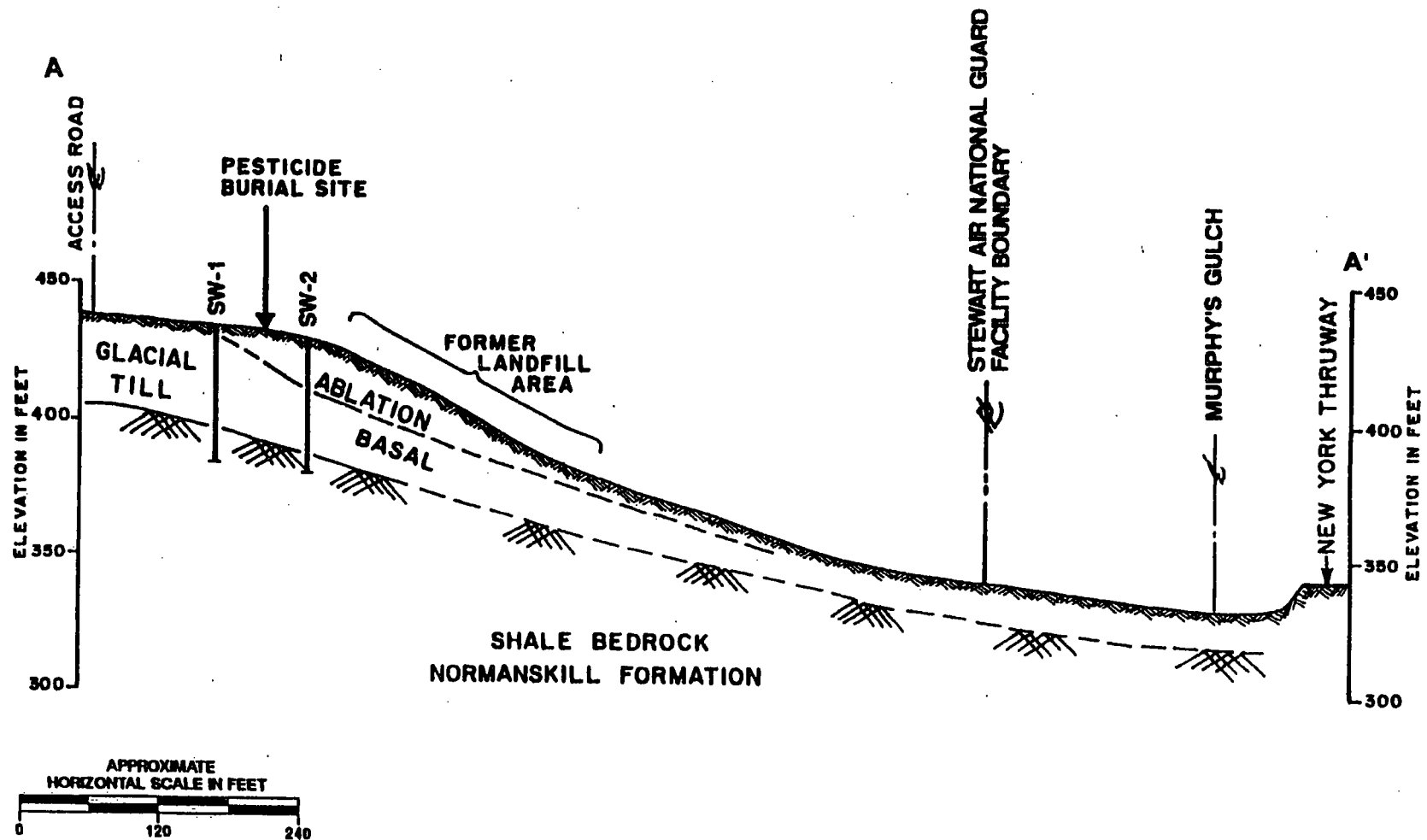
LEGEND

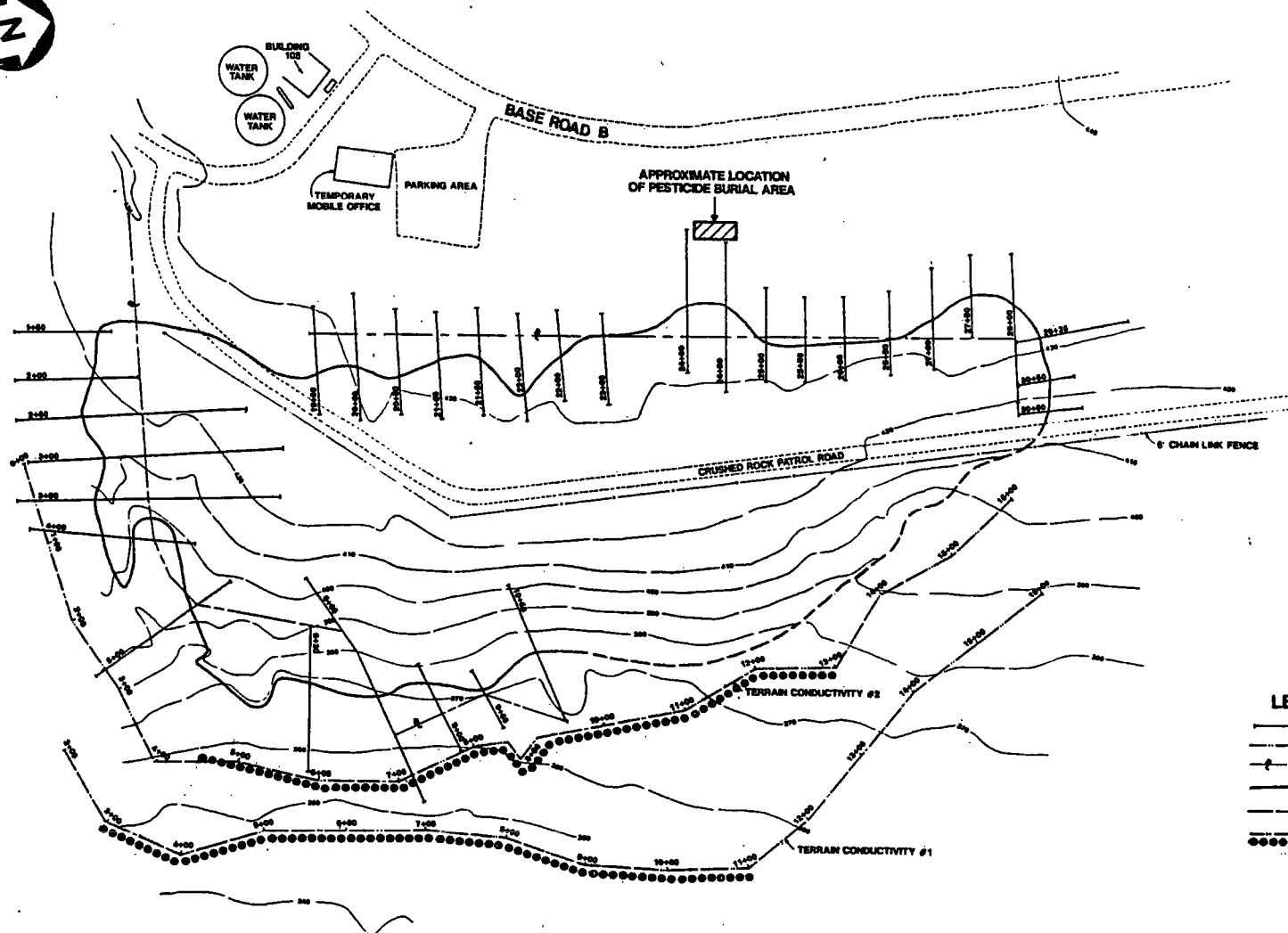
-  BOUNDARY OF FORMER LANDFILL
-  APPROXIMATE LOCATION OF PESTICIDE BURIAL SITE
LOCATION BASED ON VISUAL FIELD OBSERVATIONS AND AERIAL PHOTOGRAPHIC INTERPRETATION
-  PROPERTY LINE (APPROXIMATE)
-  APPROXIMATE STUDY AREA
-  EXISTING 6' CHAIN LINK SECURITY FENCE
-  APPROXIMATE LOCATION OF MONITORING WELLS
INSTALLED BY DAMES AND MOORE

SCALE
0 30 60 120 FEET

ECJORDANCO <small>CONSULTING ENGINEERS</small>	SITE PLAN	
INSTALLATION RESTORATION PROGRAM STEWART AIR NATIONAL GUARD BASE, N.Y.	SI	FIGURE 1-3

Generalized Geologic Profile





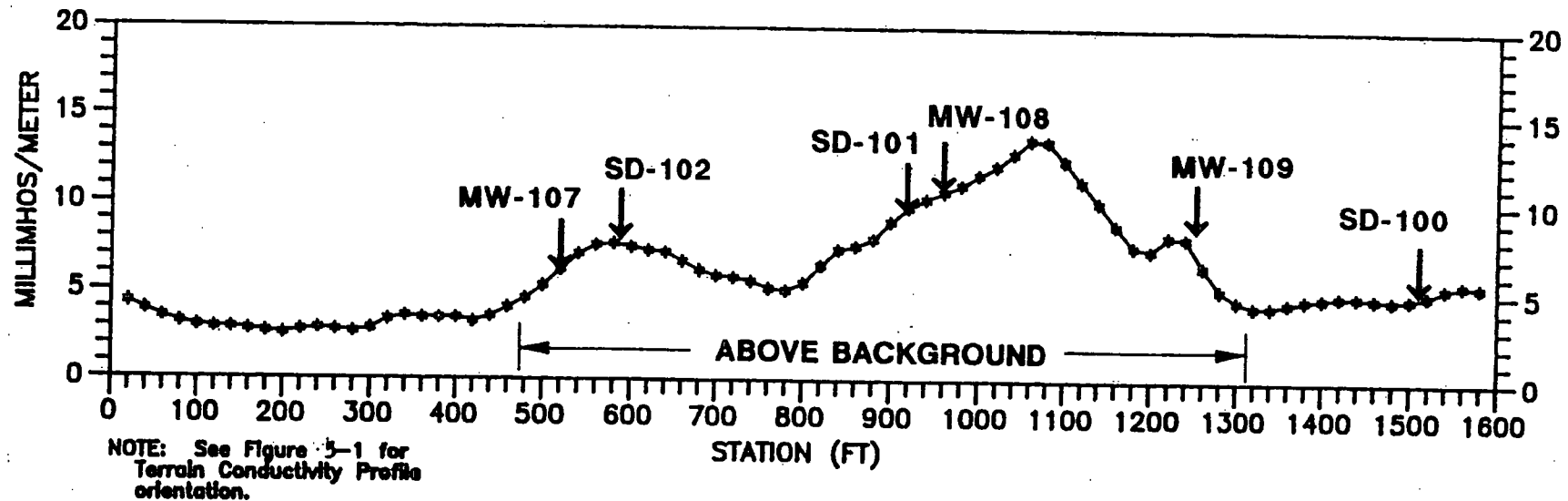
LEGEND

- MAGNETOMETER PROFILE LINE
- TERRAIN CONDUCTIVITY #1 AND #2
- - - BASE LINE
- - - BOUNDARY OF FORMER LANDFILL (BASED ON MAGNETOMETER SURVEY)
- - - BOUNDARY OF FORMER LANDFILL (BASED ON TOPOGRAPHY)
- TERRAIN CONDUCTIVITY ABOVE BACKGROUND

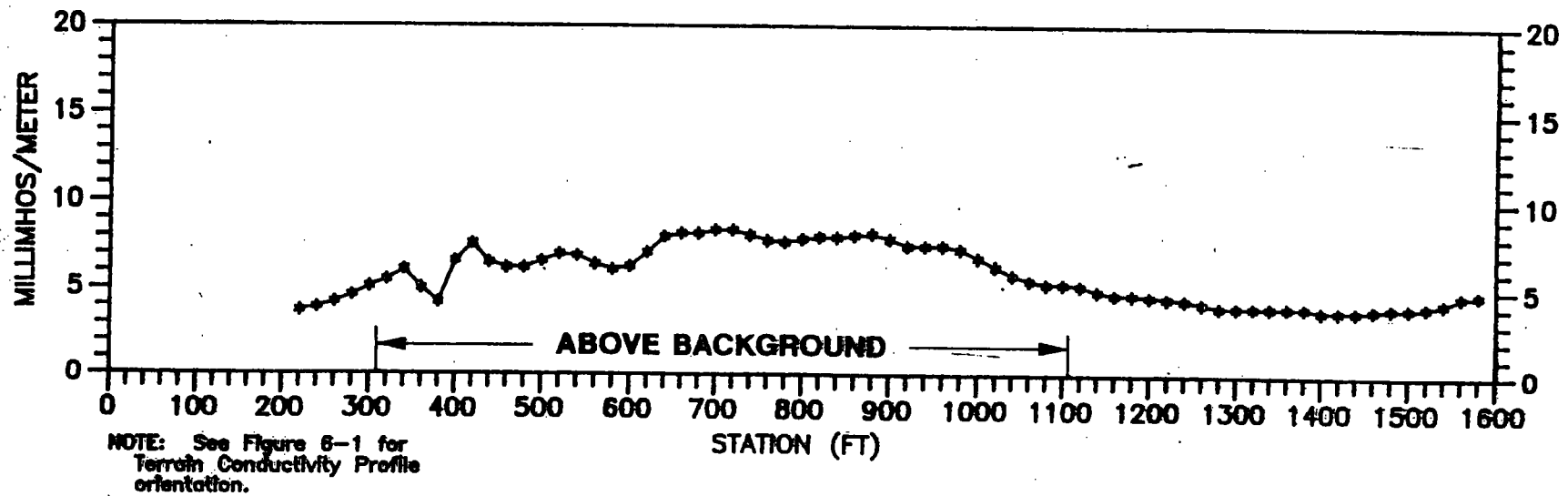


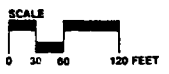
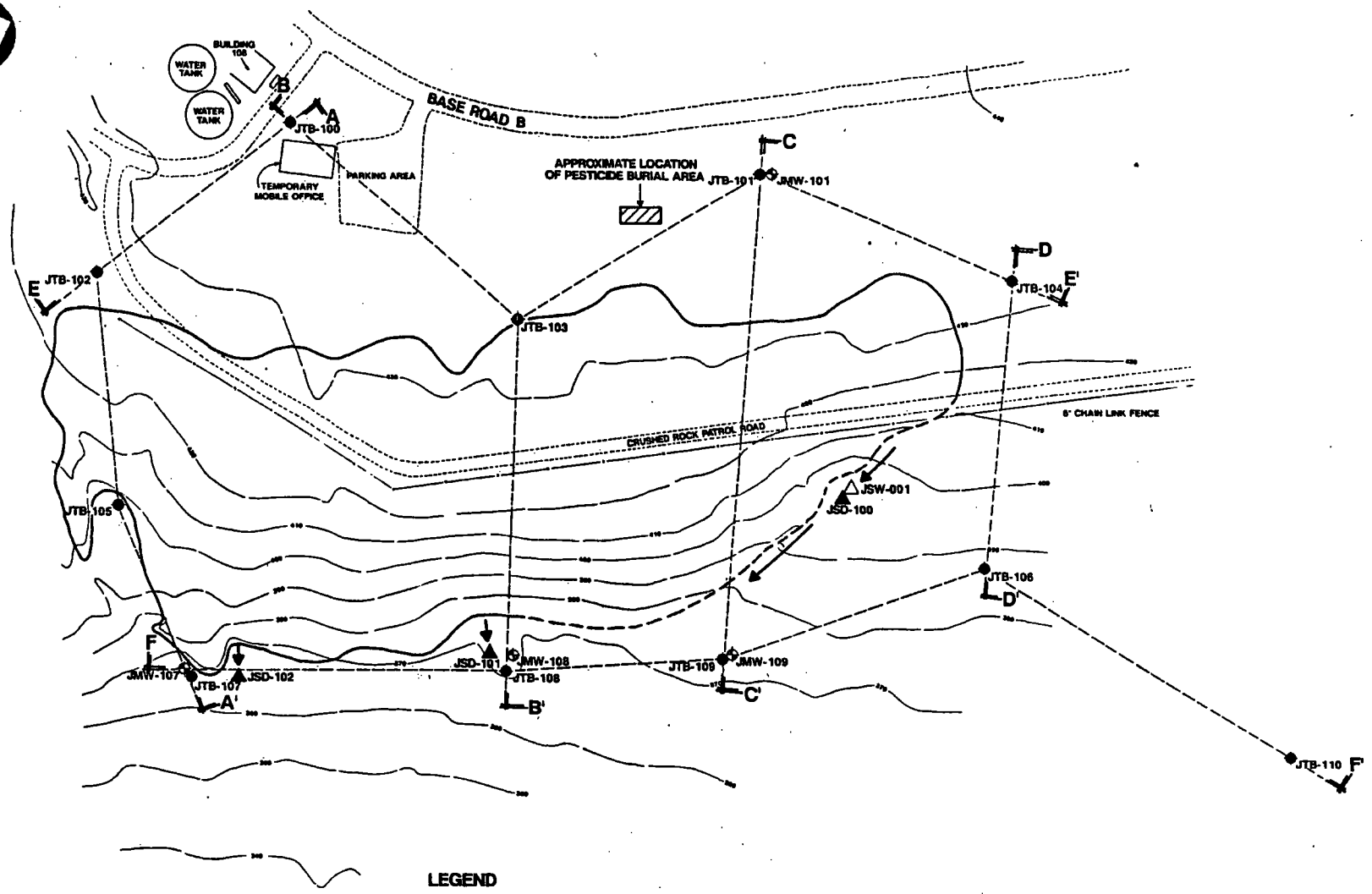
ECJORDANCO <small>CONSULTING ENGINEERS</small>	GEOPHYSICAL SURVEY TRAVERSE LOCATIONS	
<small>INSTALLATION RESTORATION PROGRAM</small> <small>STEWART AIR NATIONAL GUARD BASE, N.Y.</small>	SI	FIGURE 5-1

TERRAIN CONDUCTIVITY PROFILE - LINE 1



TERRAIN CONDUCTIVITY PROFILE - LINE 2

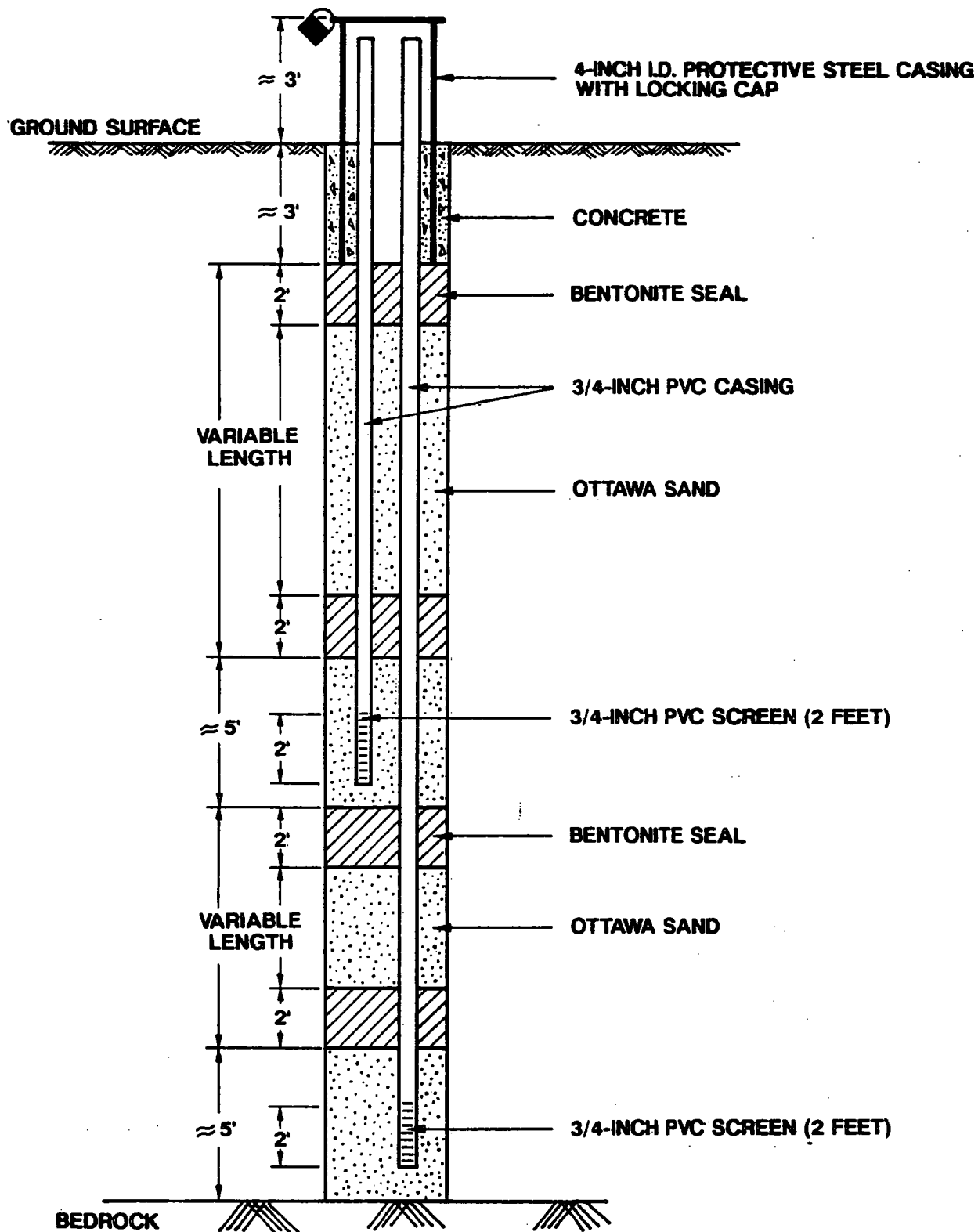




LEGEND

- ◆ JMW-101 MONITORING WELL LOCATION (EMPIRE, 1987)
- ◆ JTB-101 TEST BORING LOCATION (EMPIRE, 1987)
- ▲ JSD-100 SEDIMENT SAMPLE LOCATIONS
- △ JSW-001 SURFACE WATER SAMPLE LOCATION
- A-A' GEOLOGIC PROFILE LOCATION
- BOUNDARY OF FORMER LANDFILL (BASED ON MAGNETOMETER SURVEY)
- - - BOUNDARY OF FORMER LANDFILL (BASED ON TOPOGRAPHY)
- ← INTERMITTENT SURFACE WATER FLOW DIRECTION

ECJORDANCO <small>CONSULTING ENGINEERS</small>		EXPLORATION LOCATION PLAN	
INSTALLATION RESTORATION PROGRAM STEWART AIR NATIONAL GUARD BASE, N.Y.		SI	FIGURE 6-1



NOT TO SCALE

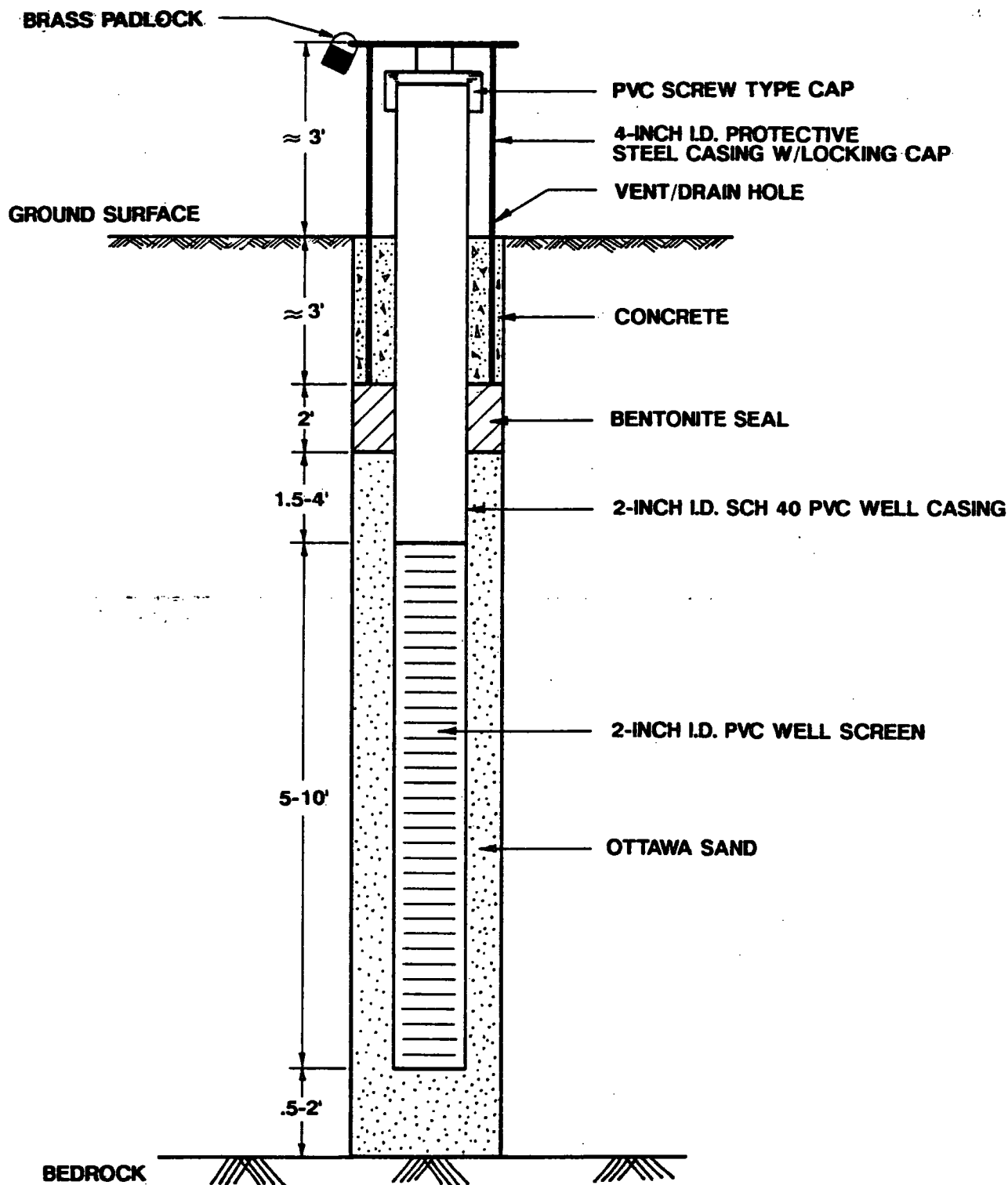
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PIEZOMETER INSTALLATION DETAILS

INSTALLATION RESTORATION PROGRAM
STEWART AIR NATIONAL GUARD BASE, N.Y.

SI

FIGURE 7-2



NOT TO SCALE

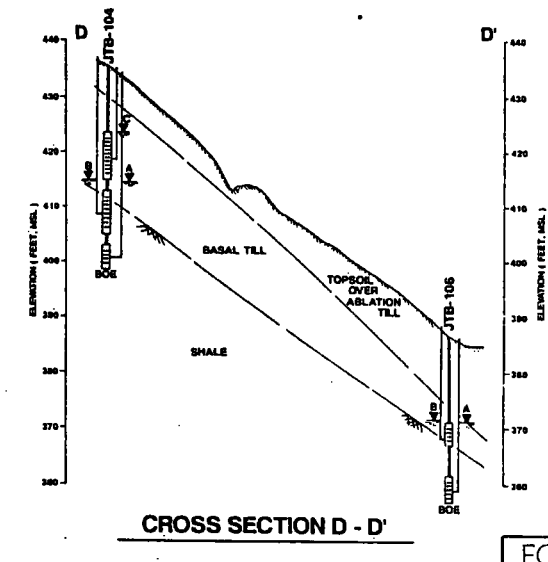
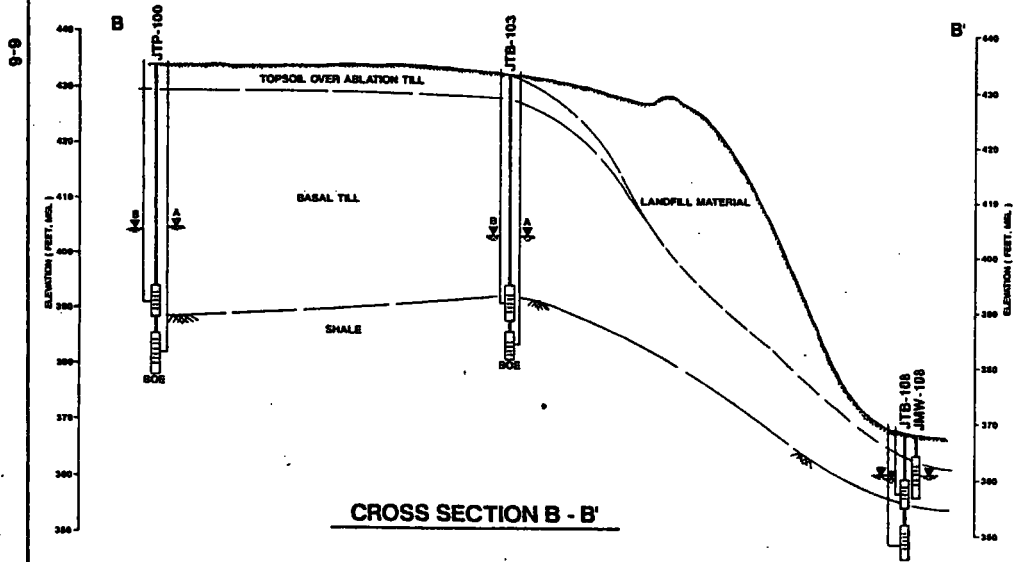
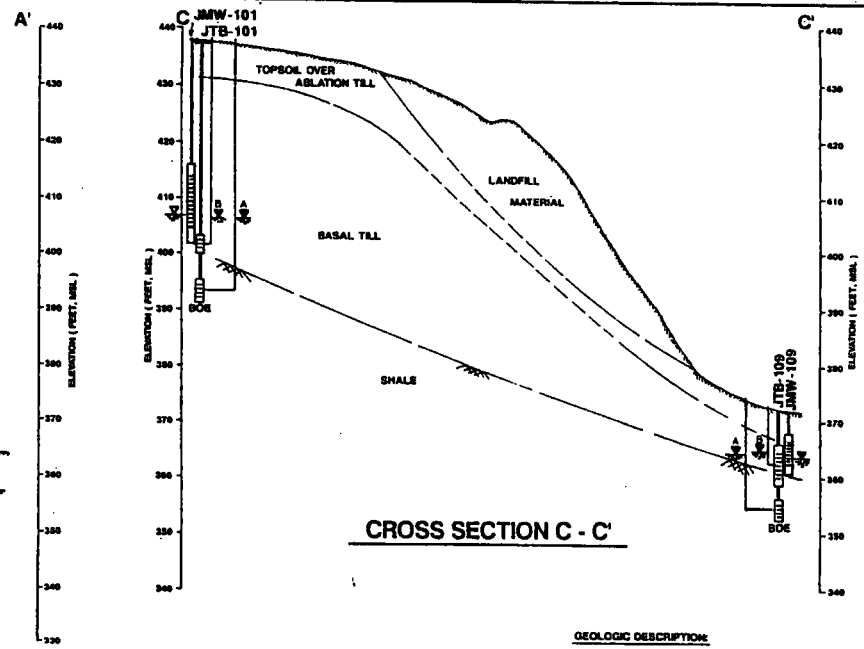
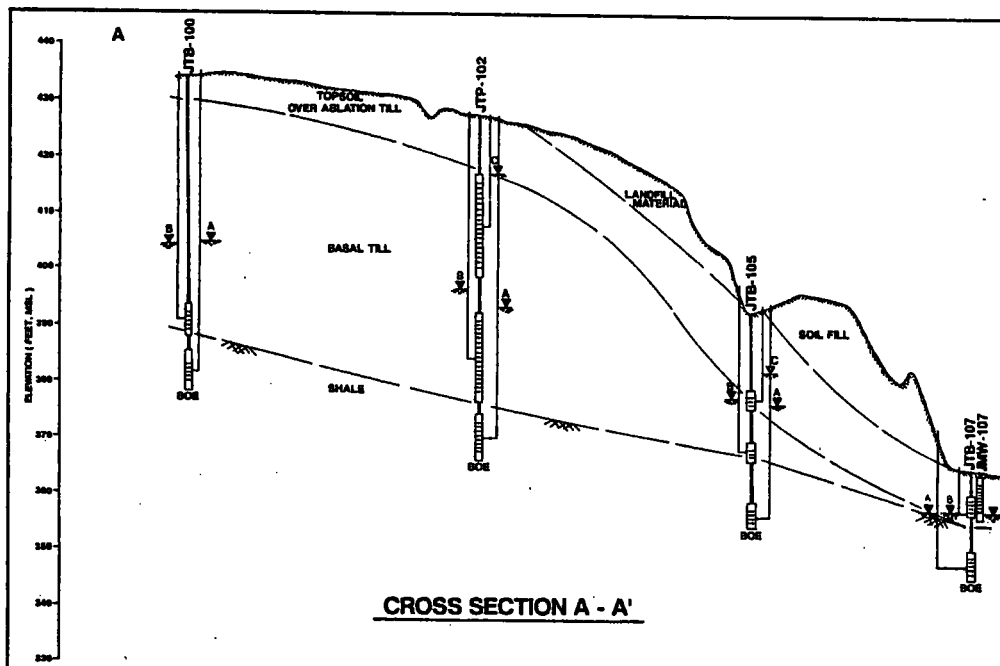
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CONSULTING ENGINEERS

MONITORING WELL
INSTALLATION DETAILS

INSTALLATION-RESTORATION PROGRAM
STEWART AIR NATIONAL GUARD BASE, N.Y.

SI

FIGURE 7-1



GEOLOGIC DESCRIPTION

ABLATION TILL - THIS STRATUM CONSISTS OF TOPSOIL OVER GENERALLY LOOSE SHOWY GRAVELLY SAND WITH SOME SILT AND TRACE OF CLAY.

BASAL TILL - THIS STRATUM CONSISTS OF GENERALLY DENSE GRAY SANDY SILT WITH SOME CLAY AND GRAVEL.

SHALE - NORMANSKILL FORMATION CONSISTS OF GRAY TO BLACKISH GRAY SHALE WITH CALCITE LENSES AND VENS.

NOTES:

- SEE FIGURE 5-1 FOR LOCATION AND ORIENTATION OF PROFILE.
- PROFILES ARE BASED ON AN INTERPRETATION OF AVAILABLE SUBSURFACE EXPLORATIONS. ACTUAL CONDITIONS BETWEEN EXPLORATIONS MAY VARY FROM THOSE SHOWN.

LEGEND

PEZOMETER LOCATION

PEZOMETER DEPTH DESIGNATOR
OBSERVED WATER LEVEL (FEET, MSL)
SEPTEMBER 14, 1987

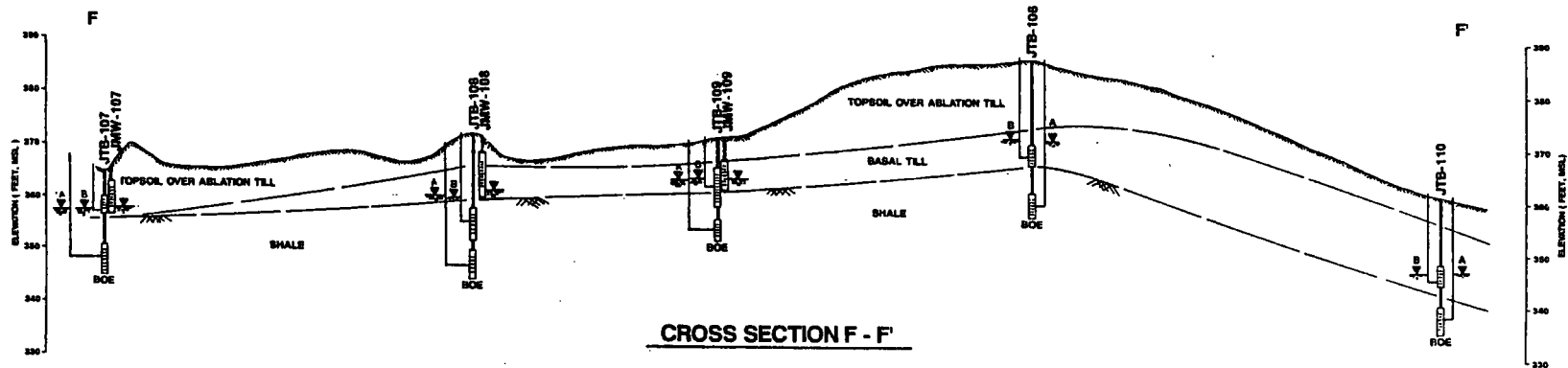
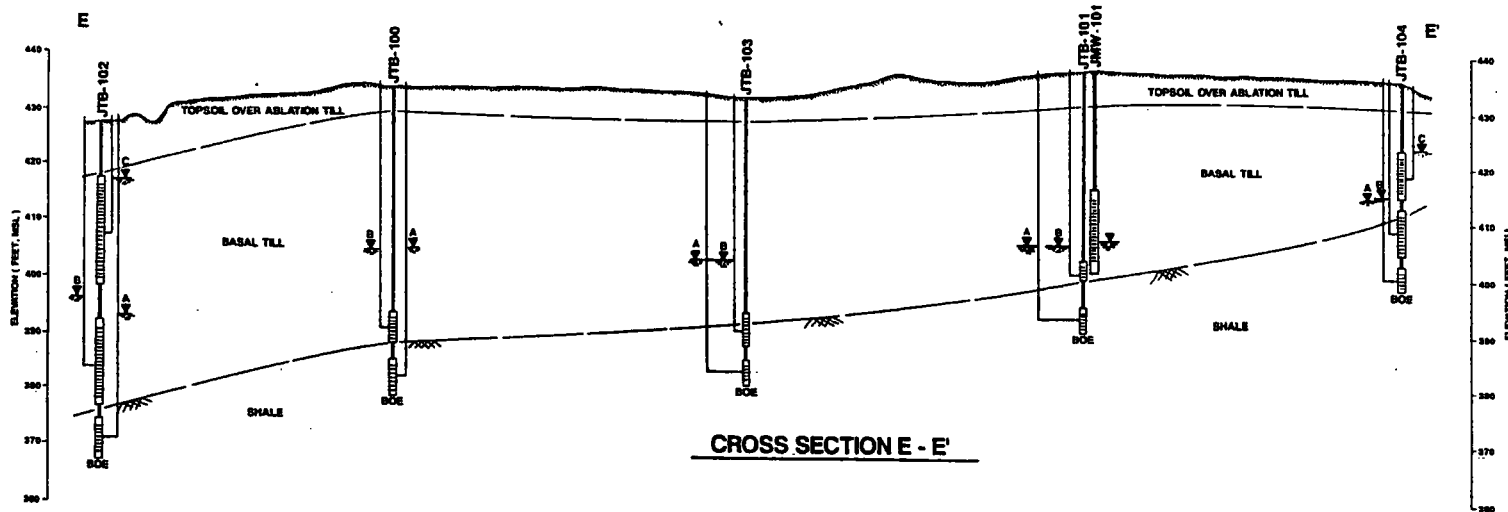
EFFECTIVE INTERVAL TOTAL SAND LENGTH
BOTTOM OF EXPLORATION

INTERPRETED BEDROCK SURFACE

SCALE

0 50 120 FEET

VERTICAL EXAGGERATION 5:1



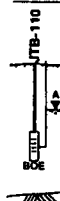
GEOLOGIC DESCRIPTION

- ABLATION TILL - THIS STRATUM CONSISTS OF TOPSOIL OVER GENERALLY LOOSE BROWN GRAVELLY SAND WITH SOME SILT AND TRACE OF CLAY.
- BASAL TILL - THIS STRATUM CONSISTS OF GENERALLY DENSE GRAY SANDY SILT WITH SOME CLAY AND GRAVEL.
- SHALE - NORMANSKILL FORMATION CONSISTS OF GRAY TO BLACKISH GRAY SHALE WITH CALSITE LENSES AND VENS.

NOTES:

- SEE FIGURE 6-1 FOR LOCATION AND ORIENTATION OF PROFILE.
- PROFILES ARE BASED ON AN INTERPRETATION OF AVAILABLE SUBSURFACE EXPLORATIONS. ACTUAL CONDITIONS BETWEEN EXPLORATIONS MAY VARY FROM THOSE SHOWN.

LEGEND



PIEZOMETER LOCATION

PIEZOMETER DEPTH DESIGNATOR
OBSERVED WATER LEVEL (FEET, MSL)
SEPTEMBER 14, 1987

EFFECTIVE INTERVAL TOTAL SAND LENGTH
BOTTOM OF EXPLORATION

INTERPRETED BEDROCK SURFACE

SCALE
0 30 60 120 FEET
VERTICAL EXAGGERATION 5:1

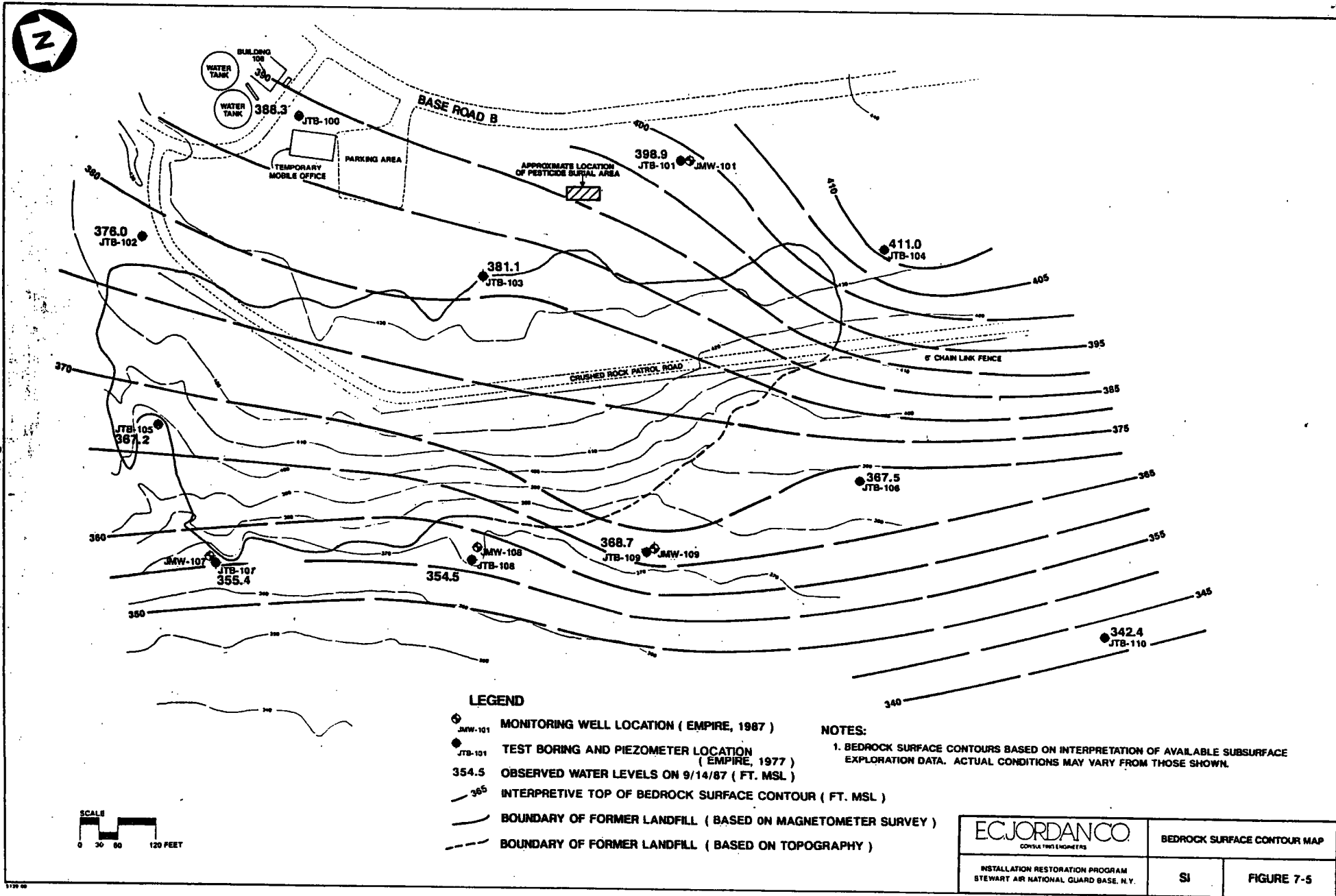
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CONSULTING ENGINEERS

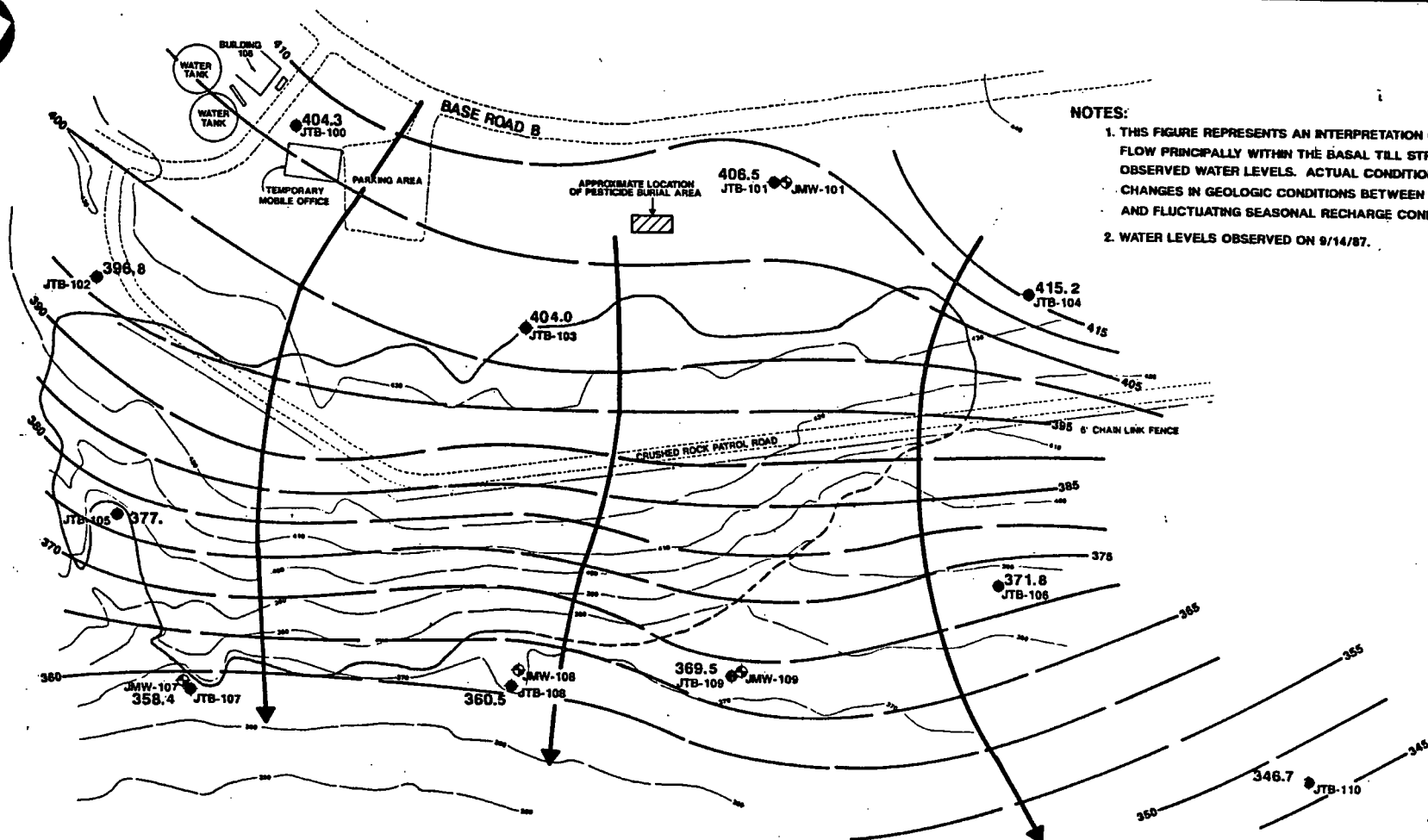
INSTALLATION RESTORATION PROGRAM
STEWART AIR NATIONAL GUARD BASE, N.Y.

INTERPRETIVE
GEOLOGIC
PROFILES E-E' AND F-F'

SI

FIGURE 6-4





NOTES:

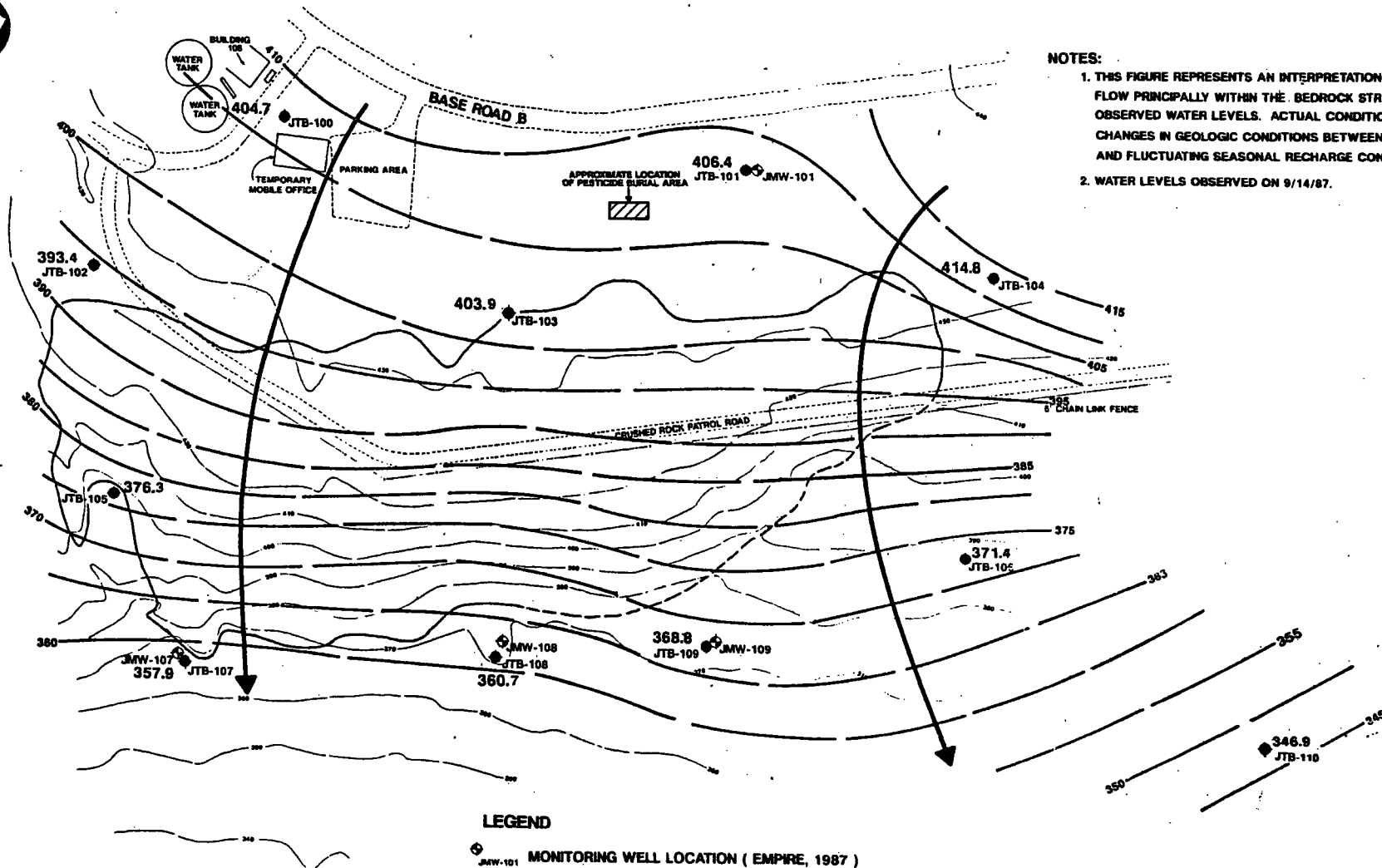
1. THIS FIGURE REPRESENTS AN INTERPRETATION OF THE GROUNDWATER FLOW PRINCIPALLY WITHIN THE BASAL TILL STRATUM ON THE DATE OF OBSERVED WATER LEVELS. ACTUAL CONDITIONS MAY VARY DUE TO CHANGES IN GEOLOGIC CONDITIONS BETWEEN MONITORING LOCATIONS, AND FLUCTUATING SEASONAL RECHARGE CONDITIONS.
2. WATER LEVELS OBSERVED ON 9/14/87.

LEGEND

- JMW-101 MONITORING WELL LOCATION (EMPIRE, 1987)
- JTB-101 TEST BORING AND PIEZOMETER LOCATION (EMPIRE, 1987)
- 360.5 OBSERVED WATER LEVELS ON 9/14/87 (FT. MSL)
- INTERPRETIVE POTENTIOMETRIC SURFACE CONTOUR (FT. MSL)
- BOUNDARY OF FORMER LANDFILL (BASED ON MAGNETOMETER SURVEY)
- BOUNDARY OF FORMER LANDFILL (BASED ON TOPOGRAPHY)
- ← INTERPRETIVE GROUNDWATER FLOW DIRECTION



EC JORDAN CO. CONSULTING ENGINEERS		POTENTIOMETRIC SURFACE BASAL TILL "B" LEVEL PIEZOMETERS	
INSTALLATION RESTORATION PROGRAM STEWART AIR NATIONAL GUARD BASE, N.Y.		SI	FIGURE 7-3



NOTES:

1. THIS FIGURE REPRESENTS AN INTERPRETATION OF THE GROUNDWATER FLOW PRINCIPALLY WITHIN THE BEDROCK STRATUM ON THE DATE OF OBSERVED WATER LEVELS. ACTUAL CONDITIONS MAY VARY DUE TO CHANGES IN GEOLOGIC CONDITIONS BETWEEN MONITORING LOCATIONS, AND FLUCTUATING SEASONAL RECHARGE CONDITIONS.
2. WATER LEVELS OBSERVED ON 9/14/87.

LEGEND

- JMW-101 MONITORING WELL LOCATION (EMPIRE, 1987)
- JTB-101 TEST BORING AND PIEZOMETER LOCATION (EMPIRE, 1977)
- 346.9 OBSERVED WATER LEVELS ON 9/14/87 (FT. MSL)
- 350 INTERPRETIVE POTENTIOMETRIC SURFACE CONTOUR (FT. MSL)
- BOUNDARY OF FORMER LANDFILL (BASED ON MAGNETOMETER SURVEY)
- - - BOUNDARY OF FORMER LANDFILL (BASED ON TOPOGRAPHY)
- INTERPRETIVE GROUNDWATER FLOW DIRECTION



EC JORDAN CO CONSULTING ENGINEERS		POTENTIOMETRIC SURFACE BEDROCK "A" LEVEL PIEZOMETERS	
INSTALLATION RESTORATION PROGRAM STEWART AIR NATIONAL GUARD BASE, N.Y.		SI	FIGURE 7-4

PCB - 210 ppb @ 12'

PCB - 210 ppb @ 31'

SURFACE

DDT - 2300-3100 ppb
DDE - 180-230 ppb
DDD - 120-170 ppb

SURFACE

BENZO(A)PYRENE	- 260 ppb
BENZO(B)FLUORANTHENE	- 450 ppb
BENZO(K)FLUORANTHENE	- 450 ppb
FLUORANTHENE	- 620 ppb
PHENANTHENE	- 500 ppb
PYRENE	- 540 ppb

SOIL/SEDIMENT

DDT - .57 ppb

SURFACE WATER

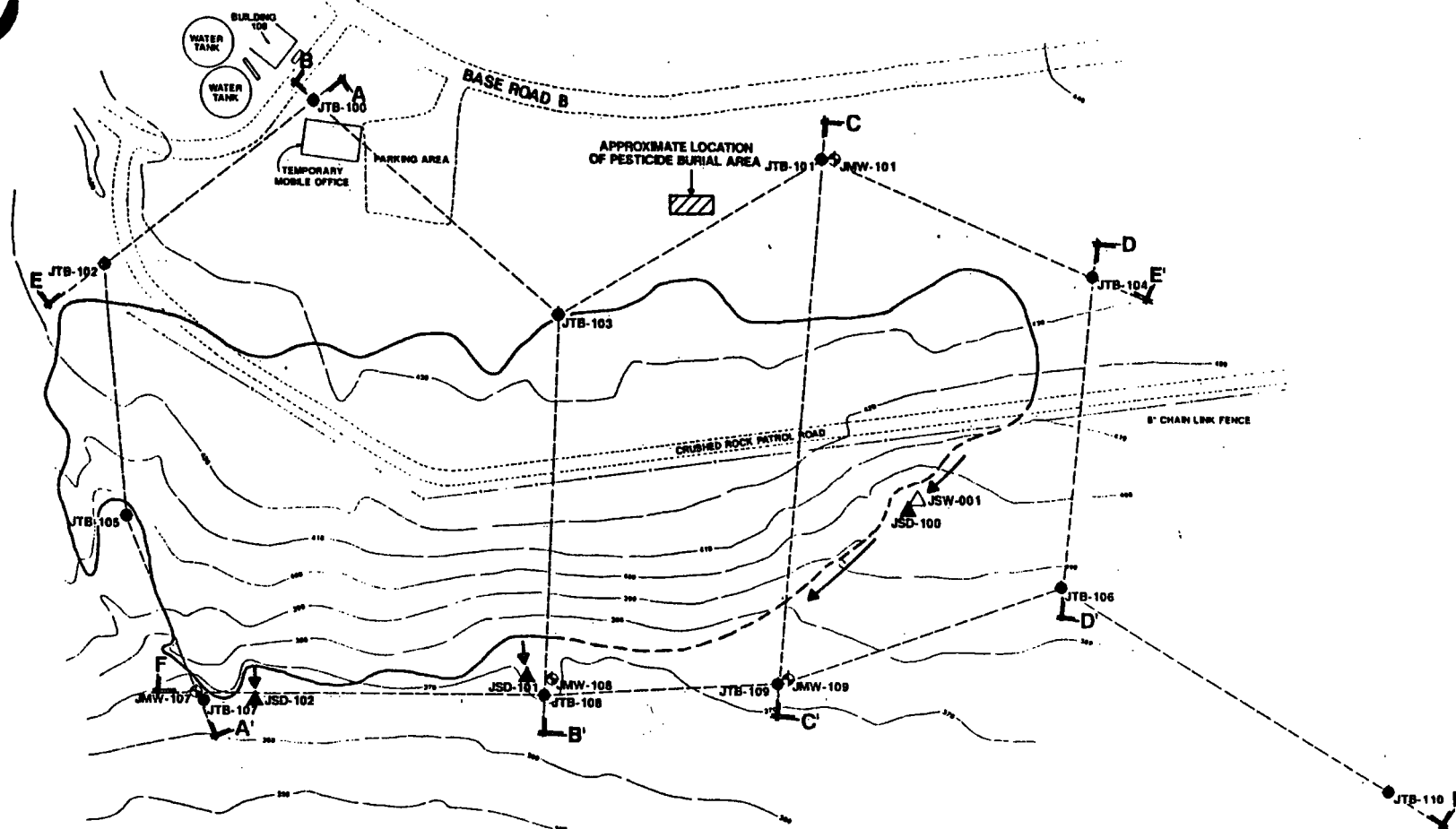
1,1 TRICHLOROETHANE - 8.6 ppb

1,1,1

BIS-(2-ETHYLHEXYL)PHTHALATE - 26 ppb

VOCs

GROUNDWATER



LEGEND

- ◆ JMW-101 MONITORING WELL LOCATION (EMPIRE, 1987)
- ◆ JTB-101 TEST BORING LOCATION (EMPIRE, 1987)
- ▲ JSD-100 SEDIMENT SAMPLE LOCATIONS
- △ JSW-001 SURFACE WATER SAMPLE LOCATION
- └─┘ GEOLOGIC PROFILE LOCATION
- BOUNDARY OF FORMER LANDFILL (BASED ON MAGNETOMETER SURVEY)
- BOUNDARY OF FORMER LANDFILL (BASED ON TOPOGRAPHY)
- ← INTERMITTENT SURFACE WATER FLOW DIRECTION



EXPLORATION LOCATION PLAN

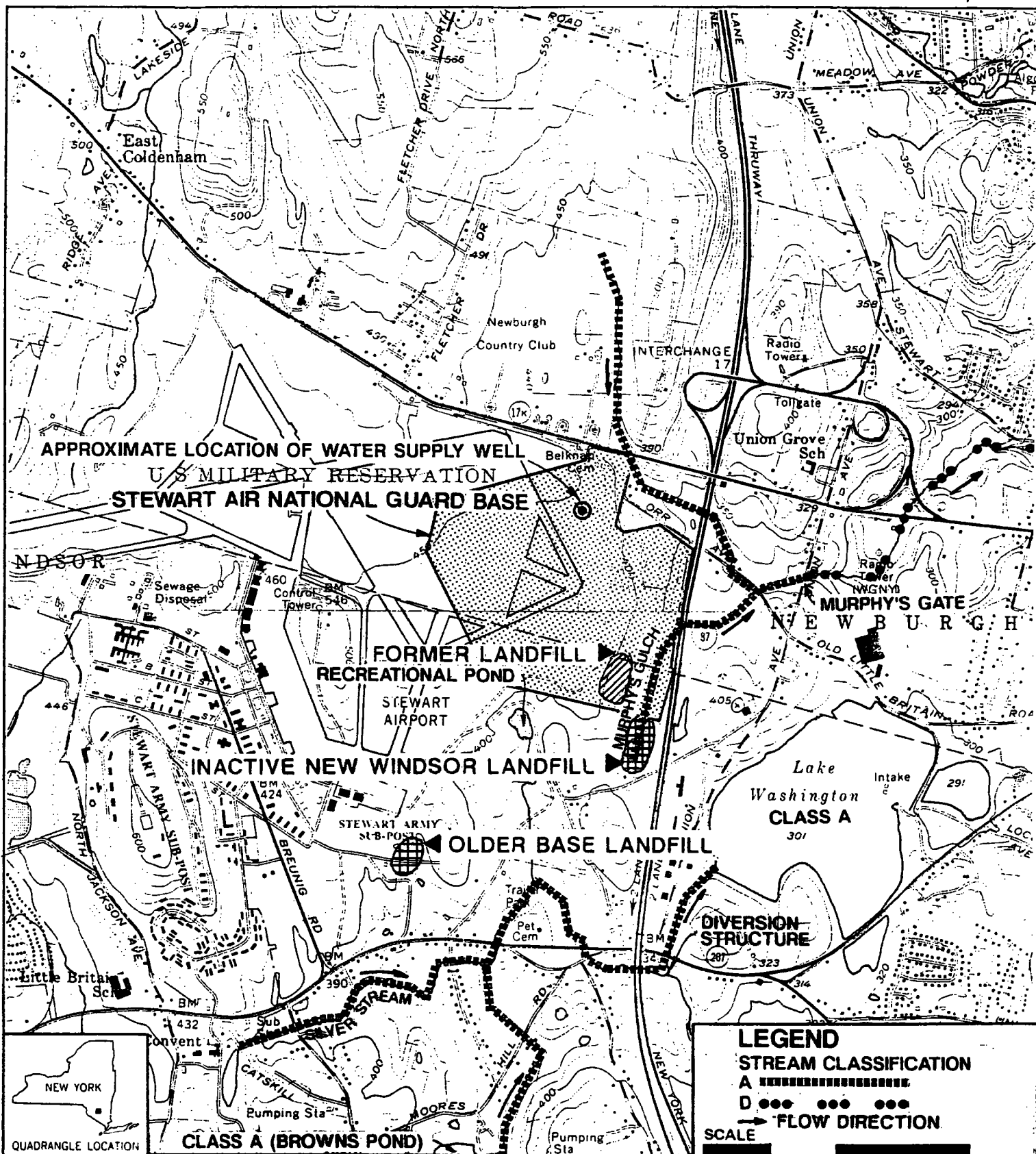
Groundwater Inorganics

Compared to Background Concentrations in MW-101 Stewart Air National Guard Facility

Chemical Species	Contract-Required Detection Limits (ppb)	Concentration Range - Downgradient	Background Concentration - MW-101
Aluminum	200	ND	ND
Arsenic	10	3.6 - 4.1	4.2 ¹
Barium	200	30 - 59 ^{1,2}	96 ^{1,2}
Calcium	5,000	128,000 - 213,000	306,000
Copper	25	ND	ND
Iron	100	41 - 206	466
Magnesium	5,000	17,700 - 27,700	89,900
Manganese	15	160 - 9,150	2,750
Mercury	0.2	7.5 ³	ND
Sodium	5,000	35,700 - 101,000	117,000
Zinc	20	11 ¹ - 20	13 ¹

Notes:

- ND Analyzed but not detected
- 1 Reported value is less than the CRDL but greater than the IDL
- 2 Reported value is estimated because of the presence of interference
- 3 Anomalous - detected in only one of four replicates



SOURCE: U.S.G.S. NEWBURGH AND CORNWALL, NEW YORK QUADRANGLES (1957) 7.5 MINUTE SERIES

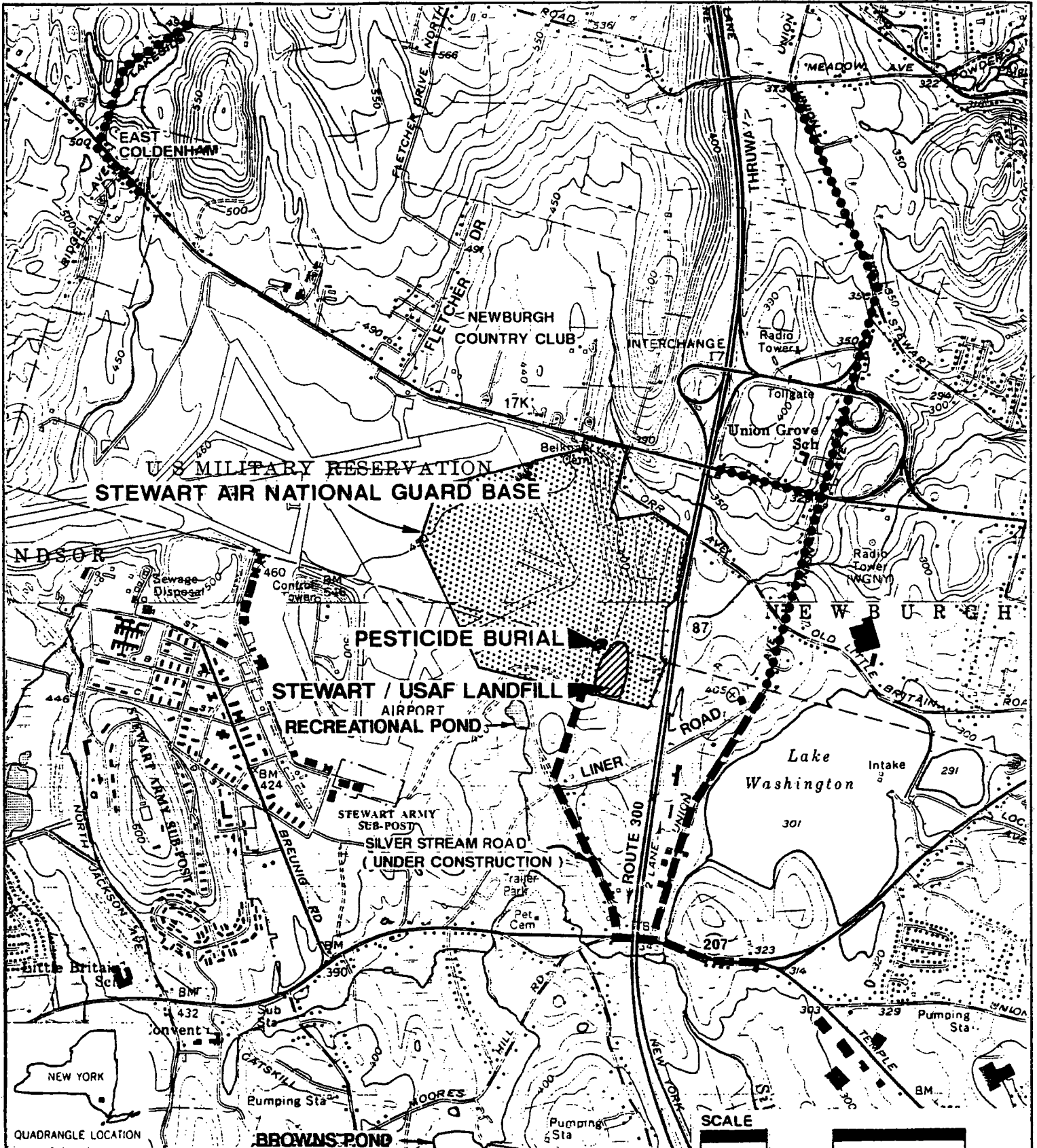
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INSTALLATION RESTORATION PROGRAM
STEWART AIR NATIONAL GUARD BASE, N.Y.

SURFACE WATER CLASSIFICATION

SI

FIGURE 8-1





SOURCE: U.S.G.S. NEWBURGH AND CORNWALL, NEW YORK QUADRANGLES (1957) 7.5 MINUTE SERIES

LEGEND

●●●●● TOWN OF NEWBURGH

■■■■■ TOWN OF NEW WINDSOR

EC. JORDAN CO.

CONSULTING ENGINEERS

INSTALLATION RESTORATION PROGRAM

STEWART AIR NATIONAL GUARD BASE, N.Y.

SELECTED WATER DISTRIBUTION ROUTES

SI

FIGURE 3-1

II. FORMER BASE LANDFILL - DECISION DOCUMENT

STEWYAB

DDTAB58.WK1

TABLE 6-1
CONTAMINATION SUMMARY

FORMER BASE LANDFILL DECISION DOCUMENT
STEWART ANGB

SAMPLE MEDIA	CHEMICAL SPECIES	CONCENTRATION RANGE	COMMENTS	SITE CONTAMINANT
GROUNDWATER				
	<u>METALS</u> ($\mu\text{g/L}$)			
	MERCURY	ND - 2.0	Reported in only one of four replicates from JMW-108, mercury may be an artifact of sampling and/or analysis.	NO
	MANGANESE	160-9,290	Reported at 2,750 $\mu\text{g/l}$ in the background well. The NY Groundwater Std. of 300 $\mu\text{g/l}$ and the Federal SMCL of 50 $\mu\text{g/l}$ (based on aesthetic qualities) are exceeded. Landfill leachate is assumed to contribute to an contribute to an existing exceedance of the standard.	YES
	<u>VOCs</u>			
	1,1,1-TRICHLOROETHANE	ND - 8.6	Reported in JMW-107 only, concentration is significantly lower than the USEPA MCL of 200 $\mu\text{g/l}$.	YES
X	TRACE VOCs (1)	(below CRDL)	Acetone and methylene chloride are assumed to be sampling or analytical artifacts. All others were estimated at levels below the CRDL. Their presence is suspect.	YES
	<u>SVOCs</u>			
X	BIS(2-ETHYLHEXYL)- PHTHALATE (BEHP)	ND - 26	BEHP was reported at low ppb levels in several samples as well as the sampler blank. It is considered to be an artifact of sampling and/or analysis.	NO
	<u>PEST/PCB</u> (none reported)	---		

TABLE C-1
GROUNDWATER INORGANICS
COMPARED TO BACKGROUND CONCENTRATIONS

FORMER BASE LANDFILL DECISION DOCUMENT
STEWART ANGB

CHEMICAL SPECIES	CONTRACT-REQUIRED DETECTION LIMITS (ppb)	CONCENTRATION RANGE (ppb) (1)	BACKGROUND CONC. (ppb) (2)
CALCIUM	5000	128,000 - 211,500 (3)	306,000
IRON	100	ND - 135 (3)	466
MAGNESIUM	5000	17,750 - 27,525 (3)	89,900
MANGANESE	15	160 - 9,290 (4)	2,750
MERCURY	0.2	ND - 2.0 (5)	ND
SODIUM	5000	35,700 - 100,150	117,000
SULFATE	NA	40 - 60	1,300,000

NOTES:

- ppb Parts per billion (micrograms per liter).
- ND Not detected.
- (1) Concentrations reported in JMW-107, JMW-108, and JMW-109.
- (2) Concentrations reported in the background well, JMW-101.
- (3) Average concentrations of four replicates from JMW-108.
- (4) Average concentrations of two replicates from JMW-109.
- (5) Mercury was reported in only one of four replicates in JMW-108, and is reported as an average concentration.

TABLE C-2
TRACE VOC CONCENTRATIONS IN GROUNDWATER
COMPARED TO STANDARDS/CRITERIA

FORMER BASE LANDFILL DECISION DOCUMENT
 STEWART ANGB

CHEMICAL SPECIES	TRACE CONCENTRATION		STANDARD OR CRITERIA (ppb)		EXCEEDANCE?
	CRDL (ppb) (1)	RANGE (ppb) (2)			
1,1,1-TRICHLOROETHANE	5	ND - 8.6	200	(4)	NO
BROMOMETHANE	10	ND - 1.6 (J)	10	(3)	NO
trans-1,2-DICHLOROETHENE	5	4.4 - 4.8 (J)	100	(4)	NO
VINYL CHLORIDE	10	ND - 4.8 (J)	2	(4)	YES
CHLOROFORM	5	1.7 - 4.3 (J)	100	(5)	NO
CHLOROMETHANE	10	ND - 1.7 (J)	NA		--
1,1-DICHLOROETHANE	5	1.7 - 4.9 (J)	NA		--
CHLOROETHANE	10	1.2 - 5.5 (J)	NA		--

NOTES:

- ppb Parts per billion/micrograms per liter
- (1) Contract-Required Detection Limit
- (2) Trace concentrations - estimated concentrations (J) reported below the contract-required detection limit.
- (3) USEPA Lifetime Health Advisory (HA).
- (4) USEPA Maximum Contaminant Level (MCL).
- (5) National Interim Primary Drinking Water Regulation (NIPDWR).
- NA Not available.

STEWART

DDTAB56.WK1

TABLE 6-1
CONTAMINATION SUMMARY

FORMER BASE LANDFILL DECISION DOCUMENT
STEWART ANGB

SAMPLE MEDIA	CHEMICAL SPECIES	CONCENTRATION RANGE	COMMENTS	SITE CONTAMINANT
SURFACE				
WATER ($\mu\text{g/l}$)			ALUMINUM AT $739 \mu\text{g/l}$, EXCEEDED AWQC OF $87 \mu\text{g/l}$	YES
<u>METALS</u>	---	---	Other No metals reported above background.	NO
<u>VOCs</u>	(none reported)	---		
<u>SVOCs</u>	(none reported)	---		
<u>PEST/PCB</u>	4,4-DDT	0.57	The only significant contaminant reported in the single surface water sample, JSW-100, was 4,4-DDT. This contaminant is discussed in the PPBA Letter Report (E.C. Jordan, 1989b).	NO
SEDIMENT ($\mu\text{g/l}$)				
<u>METALS</u>	---	---	Reported concentrations were lower than soil background ranges for metals (see Table C-4, Appendix C).	NO
<u>VOCs</u>				
	METHYLENE CHLORIDE	28	Methylene chloride and acetone were present in the blank. These VOCs assumed to be artifacts of sampling and/or analysis.	NO
	ACETONE	15		
<u>PEST/PCBs</u>				
	4,4-DDT	2300	The only significant contaminant reported in the single sediment sample, JSD-100, was 4,4-DDT and 4,4-DDE. Contamination is discussed in the PPBA Letter Report, (Jordan, 1989b).	NO
	4,4-DDE	180		
<u>SVOCs</u>	(none reported)	-		NO

stewtab
DDTAB51.wk1

TABLE C-4
SEDIMENT INORGANICS
COMPARED TO BACKGROUND CONCENTRATIONS

FORMER BASE LANDFILL DECISION DOCUMENT
STEWART ANGB

CHEMICAL SPECIES	CONTRACT-REQUIRED DETECTION LIMITS (ppm)	CONCENTRATION RANGE (ppm) (1)	ANTICIPATED BACKGROUND RANGE (ppm) (2)
ARSENIC	2	3.9	0.1 - 73
CADMIUM	1	-	0.01 - 70 (3)
CHROMIUM	2	21	1 - 1,000
COPPER	10	44	< 1-700
LEAD	1	27	< 10 - 300
MERCURY	0.02	-	0.01 - 3.4
NICKEL	8	20	< 5 - 700
ZINC	4	104	< 5 - 2,900
BARIUM	40	86	10 - 1,500
IRON	20	32,600	100 - 7,100,000
MANGANESE	3	1,190	< 2 - 7,000
VANADIUM	10	22	< 7 - 300
ALUMINUM	40	15,600	7000 - > 100,000
MAGNESIUM	1,000	6,520	50 - 50,000
CALCIUM	1,000	9,060	100 - 280,000

NOTES:

ppm Parts per million (milligrams per kilogram).

ND Not detected.

(1) Concentrations reported in JSD-100.

(2) No sediment background ranges were available, therefore, soil background ranges from scientific literature were used (Shacklette, 1984).

(3) Dragun, 1988.

STEW7AB

DDTAB56.WK1

TABLE 6-1
CONTAMINATION SUMMARY

FORMER BASE LANDFILL DECISION DOCUMENT
STEWART ANGB

SAMPLE MEDIA	CHEMICAL SPECIES	CONCENTRATION RANGE	COMMENTS	SITE CONTAMINANT
SURFACE				
SOILS ($\mu\text{g}/\text{kg}$)				
<u>METALS</u>		-	Reported within reference background levels.	NO
<u>SVOCs</u>				
	BENZO(a)PYRENE	ND - 260	+ These SVOC concentrations are all lower than background ranges for urban soils (see Table C-5, Appendix C).	UNKNOWN
	FLUORANTHENE	ND - 620		
	PYRENE	73 - 540		
	CHRYSENE	ND - 370		
	BENZO(a)ANTHRACENE	ND - 300		
	BENZO(b)FLUORANTHENE	ND - 450	No soil background ranges available; however the concentrations reported are below similar PAHs.	UNKNOWN
	PHENANTHRENE	ND - 500		
<u>VOCs</u>				
	CHLOROFORM	ND-1.3	Methylene chloride and acetone were present in the blank sample. Chloroform is also a common blank contaminant. These VOCs are assumed to be artifacts of sampling and/or analysis.	NO
	METHYLENE CHLORIDE	22-32		
	ACETONE	20-30		
<u>PEST/PCBs</u>	(none reported)	-		NO

TABLE C-3
SURFACE SOIL INORGANICS
COMPARED TO BACKGROUND CONCENTRATIONS

FORMER BASE LANDFILL DECISION DOCUMENT
STEWART ANGB

CHEMICAL SPECIES	CONTRACT-REQUIRED DETECTION LIMITS (ppm)	CONCENTRATION RANGE (ppm) (1)	ANTICIPATED BACKGROUND RANGE (ppm) (2)
ARSENIC	2	ND - 3	0.1 - 73
CADMIUM	1	ND - 2.9	0.01 - 70 (3)
CHROMIUM	2	8.7 - 11	1 - 1,000
LEAD	1	24 - 29	< 10 - 300
MERCURY	0.02	ND - 0.26	0.01 - 3.4
NICKEL	8	ND - 15	< 5 - 700
ZINC	4	43 - 59	< 5 - 2,900
BARIUM	40	ND	10 - 1,500
IRON	20	9,650 - 15,900	100 - 7,100,000
MANGANESE	3	282 - 2,310	< 2 - 7,000
VANADIUM	10	ND - 15	< 7 - 300
ALUMINUM	40	6,400 - 7,370	7000 - > 100,000
MAGNESIUM	1000	1,990 - 2,880	50 - 50,000
CALCIUM	1000	3,430 - 3,980	100 - 280,000

NOTES:

ppm Parts per million (milligrams per kilogram).

ND Not detected.

(1) Concentrations reported in JSD-101 and JSD-102.

(2) Shacklette, 1984.

(3) Dragun, 1988.

TABLE C-5
SURFACE SOIL PAH CONCENTRATIONS
COMPARED TO BACKGROUND CONCENTRATIONS

FORMER BASE LANDFILL DECISION DOCUMENT
STEWART ANGB

CHEMICAL SPECIES	CONTRACT-REQUIRED DETECTION LIMITS (ppb)	CONCENTRATION RANGE (ppb) (1)	ANTICIPATED BACKGROUND RANGE (ppb) (2)
BENZO(a)PYRENE	330	260	50,000 - 75,000 (3)
FLUORANTHENE	330	620	5,000 - 120,000 (3)
PYRENE	330	73 - 540	100,000 (3)
CHRYSENE	330	370 J	20,000 (3)
BENZO(a)ANTHRACENE	330	300 J	5 - 1,500 (3)
BENZO(b)FLUORANTHENE	330	450	NA
PHENANTHRENE	330	500	NA
ACENAPHTHENE	330	52 J	NA
ANTHRACENE	330	87 J	NA

NOTES:

- ppb Parts per billion (micrograms per kilogram).
- PAH Polyaromatic Hydrocarbons.
- J Estimated quantity.
- NA Background concentrations not available.
- (1) Concentrations reported in JSD-101 and JSD-102.
- (2) No sediment background ranges were available, therefore, soil background ranges from scientific literature were used (Shacklette, 1984).
- (3) Urban soil, (Brown, 1983).

STEWTA8
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TABLE 6-1
CONTAMINATION SUMMARY

FORMER BASE LANDFILL DECISION DOCUMENT
STEWART ANGB

SAMPLE MEDIA	CHEMICAL SPECIES	CONCENTRATION RANGE	COMMENTS	SITE CONTAMINANT
SUBSURFACE				
SOILS				
<u>METALS</u>	---	---	Reported concentrations were lower than soil background ranges for metals (see Table C-6, Appendix C).	NO
<u>VOCs</u>	(none reported)	---		
<u>SVOCs</u>	(none reported)	---		
<u>PEST/PCB</u>	Aroclor - 1254	ND - 210	PCB Aroclor-1254 was reported at 210 ug/l at depths of 31 feet in JMW-101 and 12 feet in JTB-102. Both borings are located upgradient of the landfill.	NO

NOTES: ug/l - micrograms per liter (parts per billion).
 µg/kg - micrograms per kilogram (parts per billion).
 ND - Not Detected
 USEPA MCL - U. S. Environmental Protection Agency Maximum Contaminant Level.
 CRDL - Contract-required detection limit.
 (1) For list and concentrations of trace VOCs in groundwater, see Table C-2, Appendix C.

TABLE C-6
SUBSURFACE SOIL INORGANICS
COMPARED TO BACKGROUND CONCENTRATIONS

FORMER BASE LANDFILL DECISION DOCUMENT
STEWART ANGB

CHEMICAL SPECIES	CRDL (ppm) (1)	CONCENTRATION RANGE (ppm)	BACKGROUND CONCENTRATIONS (ppm) (2)	REFERENCE CONCENTRATIONS (ppm) (3)	
ARSENIC	2	ND - 2.5	3.1 - 3.4	0.1 - 73	
CADMIUM	1	ND - 1.4	ND	0.01 - 70	(4)
CHROMIUM	2	11 - 24	11	1 - 1,000	
COPPER	5	6.7 - 28	25 - 27	< 1 - 700	
LEAD	1	8 - 20	7 - 9.5	< 10 - 300	
MERCURY	0.02	ND - 0.13	ND - 0.12	0.01 - 3.4	
NICKEL	8	11 - 17	ND - 13	< 5 - 700	
ZINC	4	ND - 117	48 - 54	< 5 - 2,900	
BARIUM	40	ND - 52	ND - 41	10 - 1,500	
IRON	20	17,700 - 21,400	18,800 - 19,400	100 - >100,000	
MANGANESE	3	504 - 999	471 - 790	< 2 - 7,000	
VANADIUM	10	ND - 14	12	< 7 - 300	
ALUMINUM	40	7,510 - 9,220	8,140 - 8,190	7,000 - >100,000	
MAGNESIUM	1000	3,250 - 4,070	5,830 - 6,150	50 - 50,000	
CALCIUM	1000	1,800 - 28,300	25,500 - 30,900	100 - 280,000	
POTASSIUM	1000	837 - 883	ND	50 - 37,000	

NOTES:

- ppm Parts per million (milligrams per kilogram)
- (1) Contract-Required Detection Limits
- (2) Background soil borings are JMW-101 and JTB-102.
- (3) Shacklette, 1984.
- (4) Dragun, 1988.
- ND Not Detected.

Former Base Landfill

Decision Document

Contamination Assessment

Groundwater

- Manganese > State and Federal Secondary Water Quality Standards
- Mercury > MCL in 1 of 4 replicates from one well
- 1,1,1-TCA @ 8.6 ug/l; < MCL (200 ug/l)
- Seven VOCs < CRDLs
Vinyl chloride at 4.8 ug/l in 1 of 2 ^{samples} ~~replicates~~ from one well

Soils/Sediments

- PAH @ low levels in soils, comparable to urban background levels
- DDT, DDD, and DDE in soil and pond attributable to Pesticide Pit Burial Area

Surface Water

- ALUMINUM > AWQC

Former Base Landfill

Decision Document

Risk Assessment Summary

Public Health

- Landfill contaminants of concern in groundwater
- No exposure to groundwater contaminants expected
- Hypothetical worst-case exposure scenario =
 1×10^{-4} carcinogenic risk due to vinyl chloride
- Manganese levels unlikely to pose adverse health effects

Ecological

- Aluminum > AWQC; possible chronic effects to individual organisms
 No adverse population level effects expected
- DDT and DDD attributable to Pesticide Pit

Summary:

No adverse public health or ecological effects anticipated

Former Base Landfill

Decision Document

Conclusions

- **No public health or environmental hazards exist**
- **No further remedial investigations are necessary**

Former Base Landfill

Decision Document

Decision

- **Close landfill in accordance with DEC Solid Waste Regulations (6 NYCRR Part 360)**
- **Closure Investigations**
 - **develop baseline database**
 - **install additional monitoring wells if necessary**
- **Closure Plan**
 - **present findings of Closure Investigations**
 - **design groundwater monitoring program**
 - **prepare design documents as necessary**
- **Consider Pesticide Pit Burial Area findings prior to completion of closure design documents**

III. PESTICIDE PIT BURIAL AREA - HISTORY

Pesticide Pit Burial Area

Previous Investigations and Activities

■ Dames & Moore : March 1984 - September 1985

Search for Pesticide Pit

Geophysical surveys

Test pit samples: soils and liquids

Groundwater samples: wells SW-1, SW-2, SW-3

■ E.C. Jordan : 1987

Perform SI of Landfill

Surface soil, water, and sediment samples

Groundwater samples downgradient of landfill

Hydrogeology

Pesticide Pit Burial Area

Previous Investigations and Activities *continued...*

■ GEO-CON/Dynamac : 1988 (May - July)

Pesticide Pit removal action

Post-excavation, subsurface soil samples

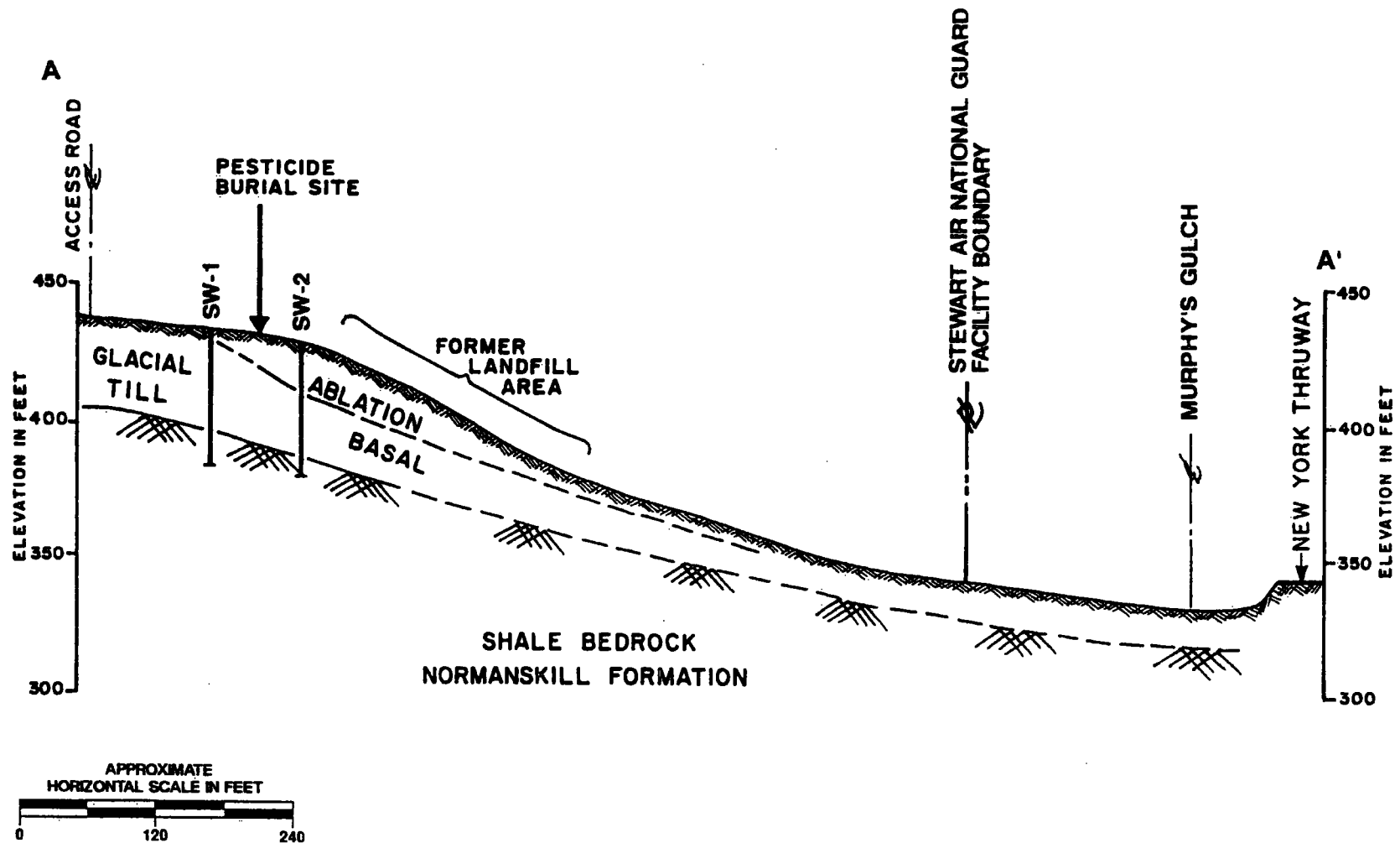
■ E.C. Jordan : 1989

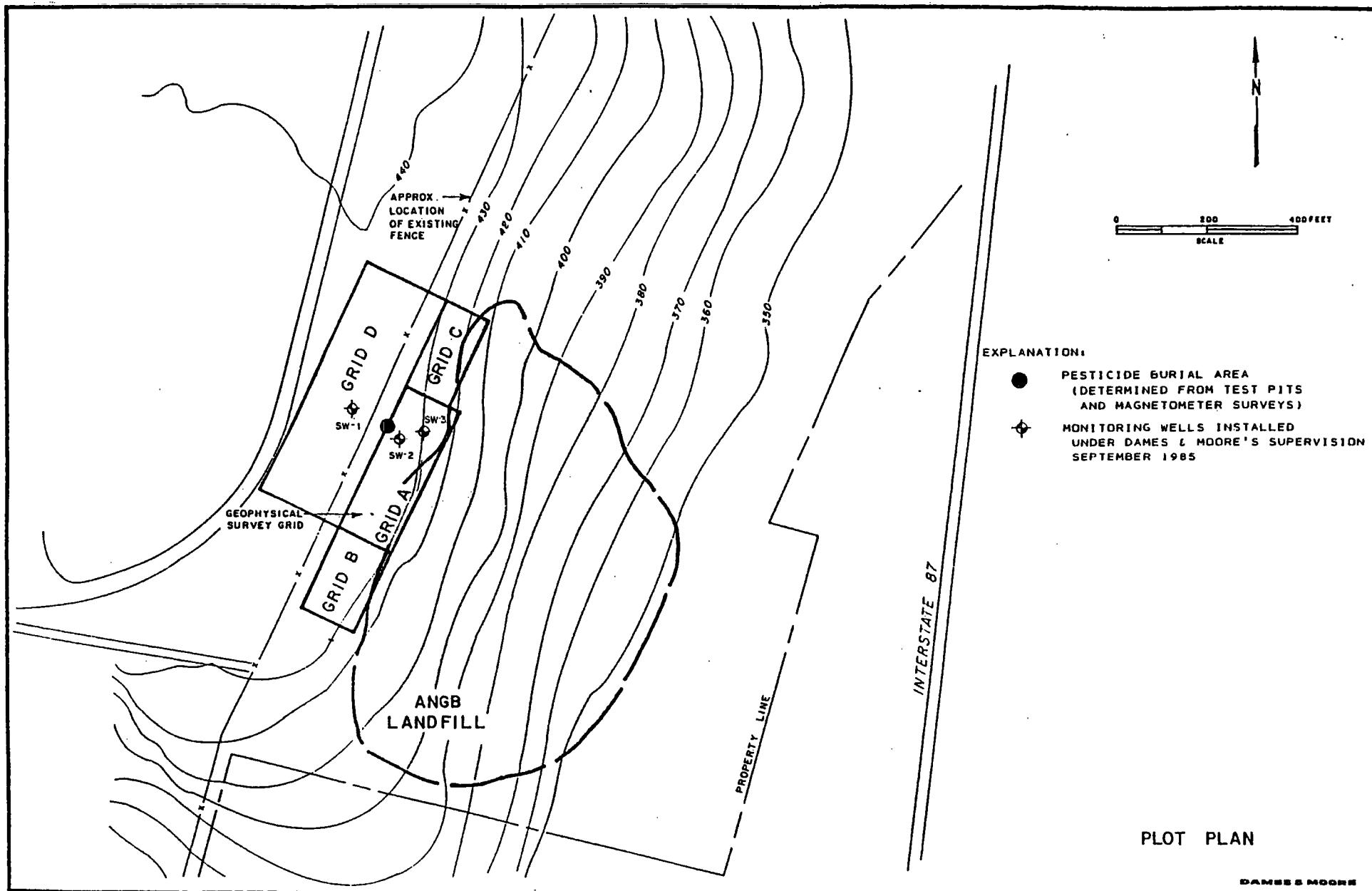
Investigate pesticide migration

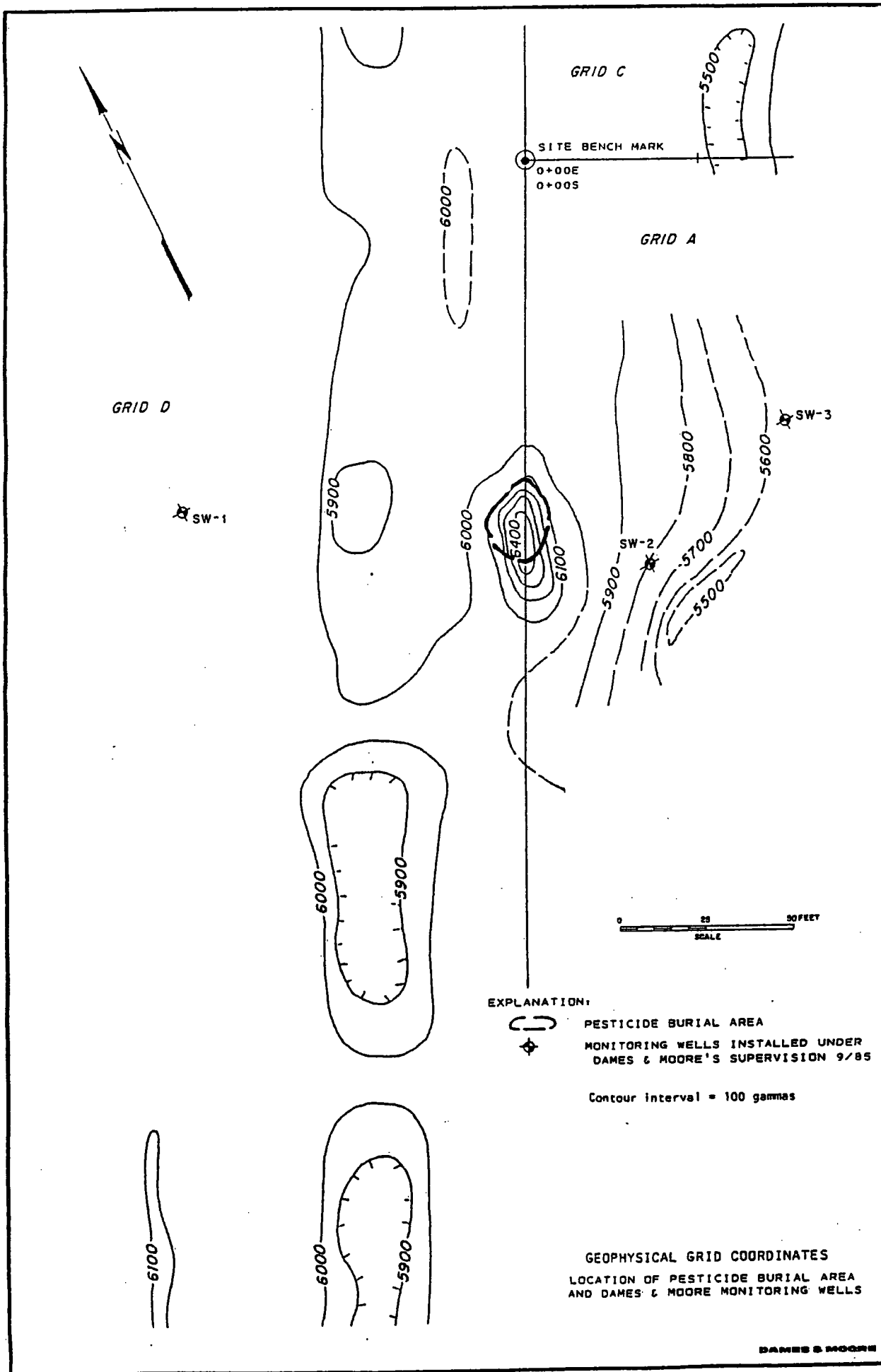
Sample SW-1, SW-2, SW-3

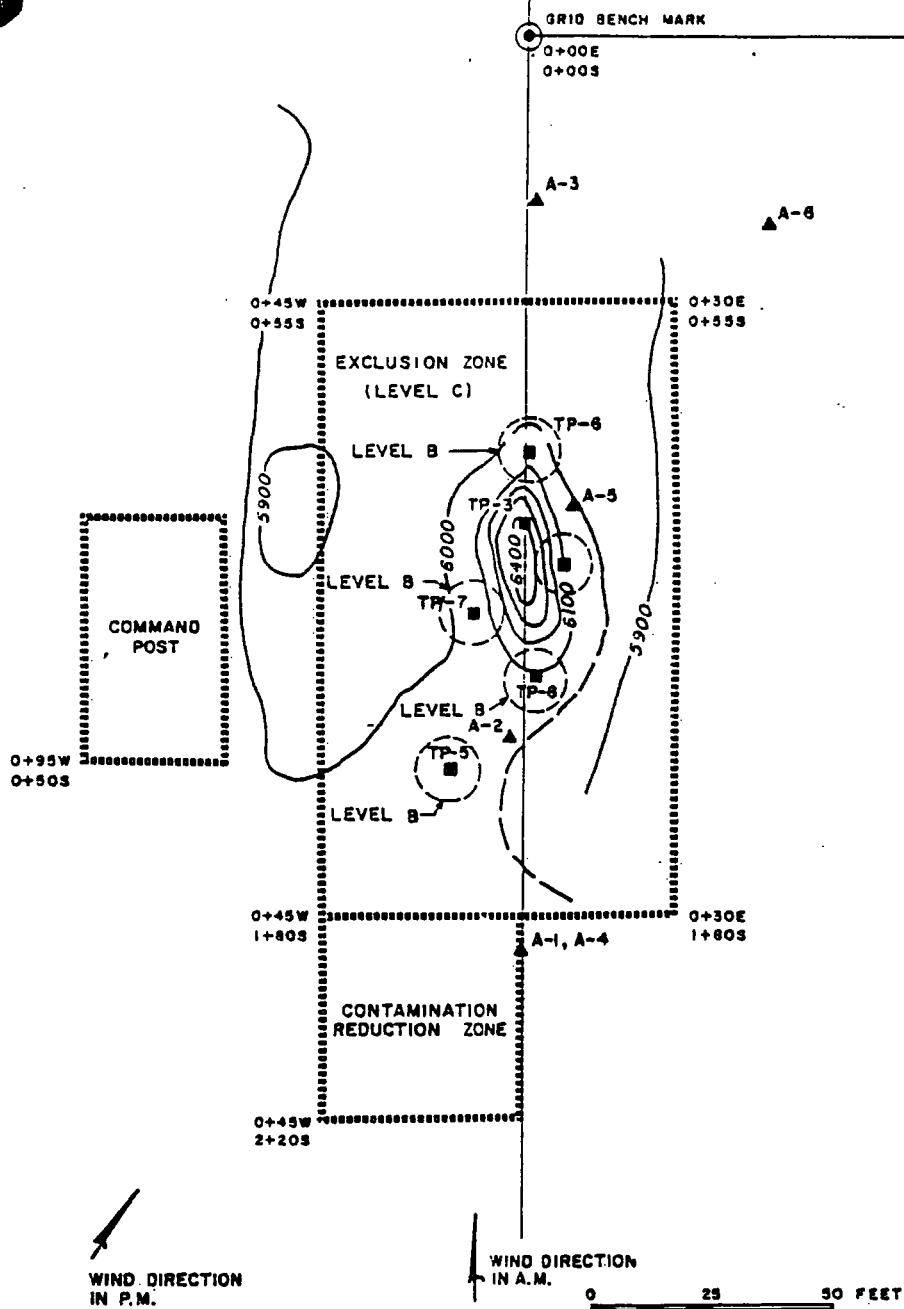
Surface soil samples downslope of pit

Generalized Geologic Profile









KEY:

- ▲ AIR MONITOR LOCATION
- TEST PIT LOCATION

NOTE:

1. AIR MONITOR LOCATIONS A-1, A-2, A-3
COLLECTED IN A.M.

AIR MONITOR LOCATIONS A-4, A-5, A-6
COLLECTED IN P.M.

FIGURE 7

**LOCATIONS OF WORK ZONES, TEST PITS
AND AIR MONITORS
STEWART AIR NATIONAL GUARD BASE**

Dames & Moore

TABLE 1. PESTICIDE CONTAMINATION IN SAMPLES FROM TEST PITS IN PBS AT STEWART ANGB

Pesticide	Concentration in Soil Sample (ppb)					Concentration in Liquids (ppb)				
	TP-3-13	TP-5	TP-6	TP-7	TP-8	TP3-I ^b	TP3-II ^b	TP-6	TP-7	TP-8
Parathion	-- ^a	--	2.2	0.59	3.9	--	--	--	--	3.8
DDE	--	--	130	6.1	7.2	--	--	1,500	4,000,000	37
DDD	3,900	--	950	140	370	7100	159,000	23,000	28,000,000	430
o,p'-DDT (2,4'-DDT)	3,900	0.06	600	25	49	950	100,000	16,000	38,000,000	360
p,p'-DDT (4,4'-DDT)	13,000	0.17	1,700	73	122	3,040	370,000	20,000	120,000,000	440
2,4-D	0.42	--	--	--	--	--	130	6.6	2.2	3.0
2,4,5-T	--	--	--	0.37	0.61	--	31.0	47.0	5.4	6.6

^a-- = less than detection limit.

NOTE: Data in this table were excerpted from Tables 2 and 3 in Dames & Moore (June 12, 1986).

TABLE 2. PESTICIDE CONCENTRATIONS IN SOIL BORINGS
AND GROUNDWATER AT WELL SW-2 AT STEWART ANGB IN 1985

Pesticide	Concentration (ppb) in groundwater	Concentration (ppm) in soil at	
		25 feet	35 feet
p,p'-DDT (4,4'-DDT)	15.0	1.5	8.2
o,p'-DDT (2,4'-DDT)	4.4	0.42	1.9
DDD	8.5	0.47	2.5
DDE	0.15	0.026	0.058
2,4-D	20.0	0.067	0.35
2,4,5-T	0.45	0.006	0.04
parathion	-- ^a	0.08	<0.01

^a-- = less than detection limit

E.C. Jordan - Landfill SI

Data Pertinent to Pesticide Pit

- **Groundwater surface approximately 30-35 feet below soil surface**
- **Groundwater velocity in vicinity of PPBA approximately 8.7 ft/yr**
- **No pesticide contamination in monitoring wells downgradient of landfill, 600 feet from PPBA**
- **Intermittent pond 450 feet downslope from PPBA**

Sediment:	4,4 -DDT	3.10	ppm
	DDE	0.230	ppm
	DDD	0.170	ppm
Water:	4,4 -DDT	0.00057	ppm

II. BACKGROUND OF SITE

CONCERNS ADDRESSED PRIOR TO REMOVAL ACTION

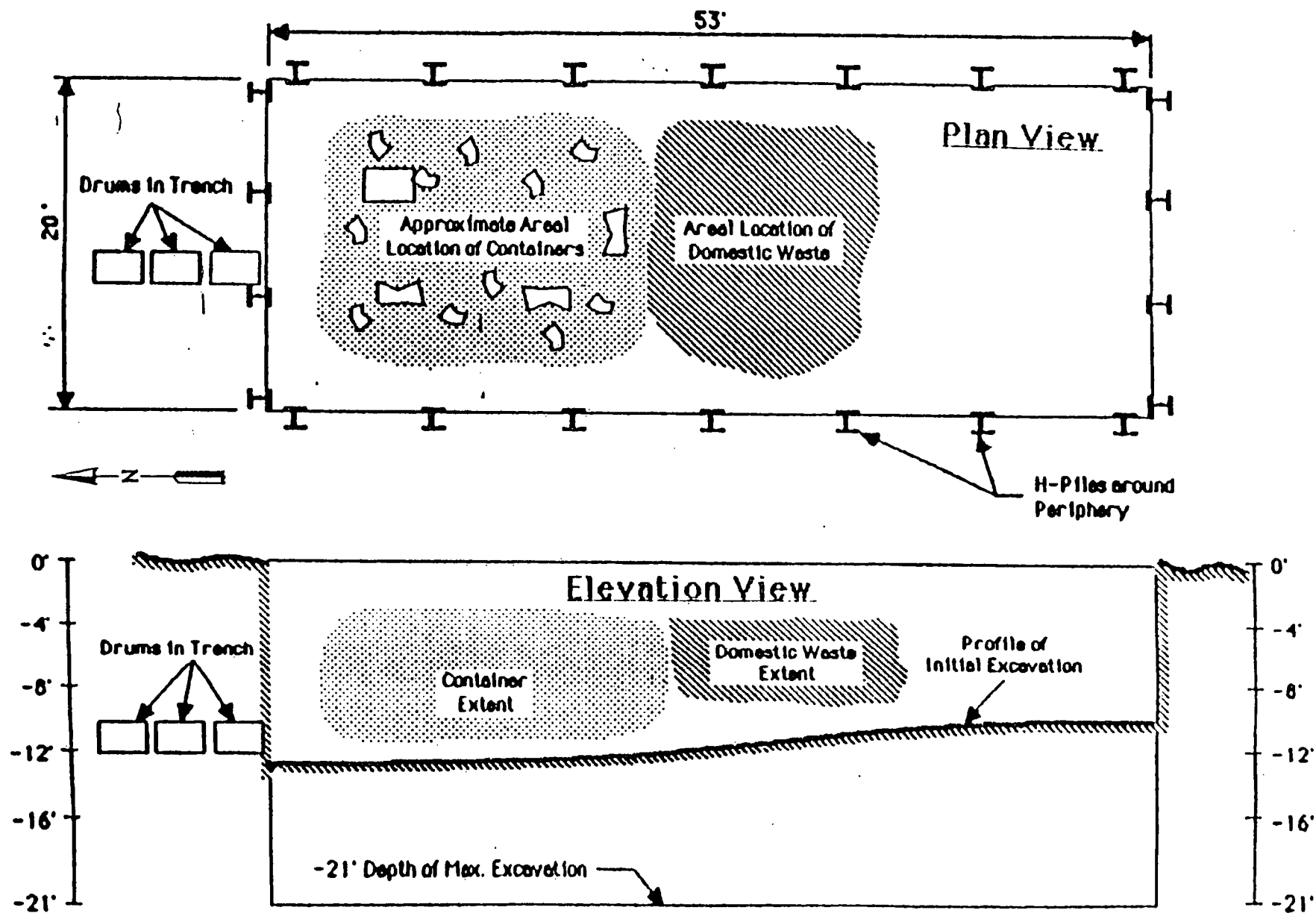
Contaminant Levels in Soils

- 10 ppm above background: pesticide level agreed upon at Draft Final Design meeting (June 1986) between ANGSC, NYANG, HMTc, N.Y.DEC, and U.S.EPA
- Removal Specifications stated that excavation would proceed to:
 - 6' below lowest level of containers, or
 - 21' depth below grade, or
 - soil residual contamination did not exceed 10 ppm above background

Areal Extent of Pit

- Aerial photo (from 1971) interpretation and magnetometer surveys (3/84, 9/84) identify target area for pit
- Test dig pits focused burial area as approx. 10' x 15'
- Final contract conservatively used pit size of 20' x 53'

Figure 4.
Plan and Elevation Views



III. REMOVAL ACTION DESCRIPTION

REMOVAL ACTIVITIES

Excavation Items

- Damaged, dispersed, and leaking drums necessitated bulk excavation procedures
- Undisturbed glacial till material very difficult to excavate
- Containers found down to a depth of approximately 10'
- Pit excavated to a minimum of 2' below the bottom of containers prior to pit floor sampling
 - Maximum depth of initial excavation was 13' (northern end)
- No containers or sanitary waste in southern end of pit
 - Soil undisturbed throughout depth of excavation (10')
- NY Times newspaper dated Oct. 1969 found in sanitary waste
- Sanitary waste found buried to 7' depth in center of pit
- No acid or plastic bottles or containers found

III. REMOVAL ACTION DESCRIPTION

REMOVAL ACTIVITIES

5 Gallon Pesticide Containers

- 105 5-gallon pesticide containers found where anticipated
- Containers limited to northern half of pit area
- Containers deliberately punctured and randomly strewn in pit
- Containers were not found below 10' depth or outside confines of pit
- No containers or debris found in southern end of pit
- Containers contained largely grayish water - little pesticides or hydrocarbon co-solvent noticed
- Majority of containers were only partially filled (1/4 to 1/2 full)

III. REMOVAL ACTION DESCRIPTION

REMOVAL ACTIVITIES

55 Gallon Drums

- 13 55-gallon drums located among pesticide containers
- 3 drums of waste oil found in horizontal trench outside of pit along northern end of pit
- Most drums punctured or left open
- Drums appeared to contain primarily waste oil and paint stripper residue

Figure 5.
Sample Locations

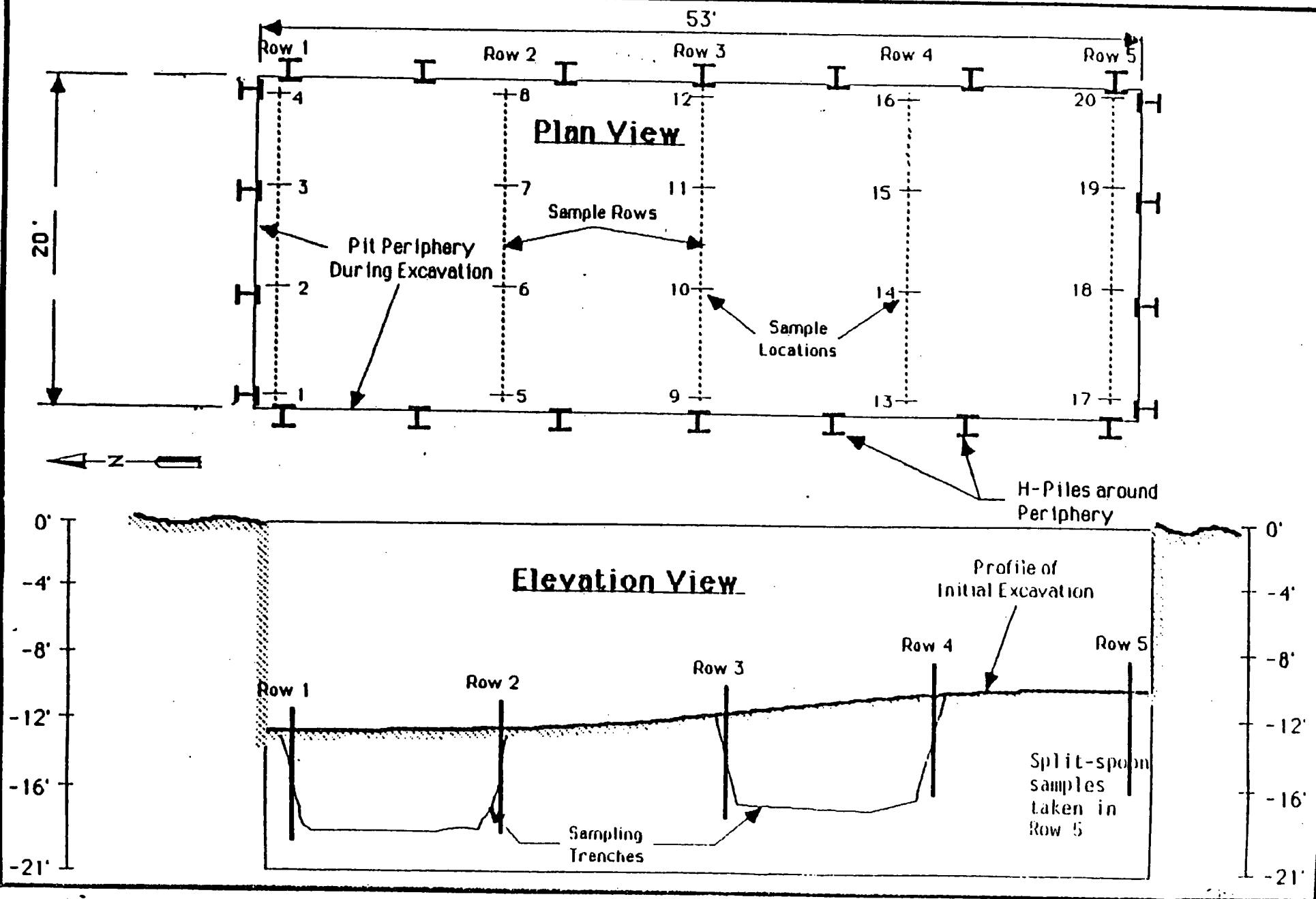


Figure 4: Pit Bottom Sampling Results

Notes:

- 1) All results represent the total of DDT, DDD, And DDE
- 2) Results are listed as mg/kg or ppm
- 3) Samples were composited at each elevation from four locations in each row

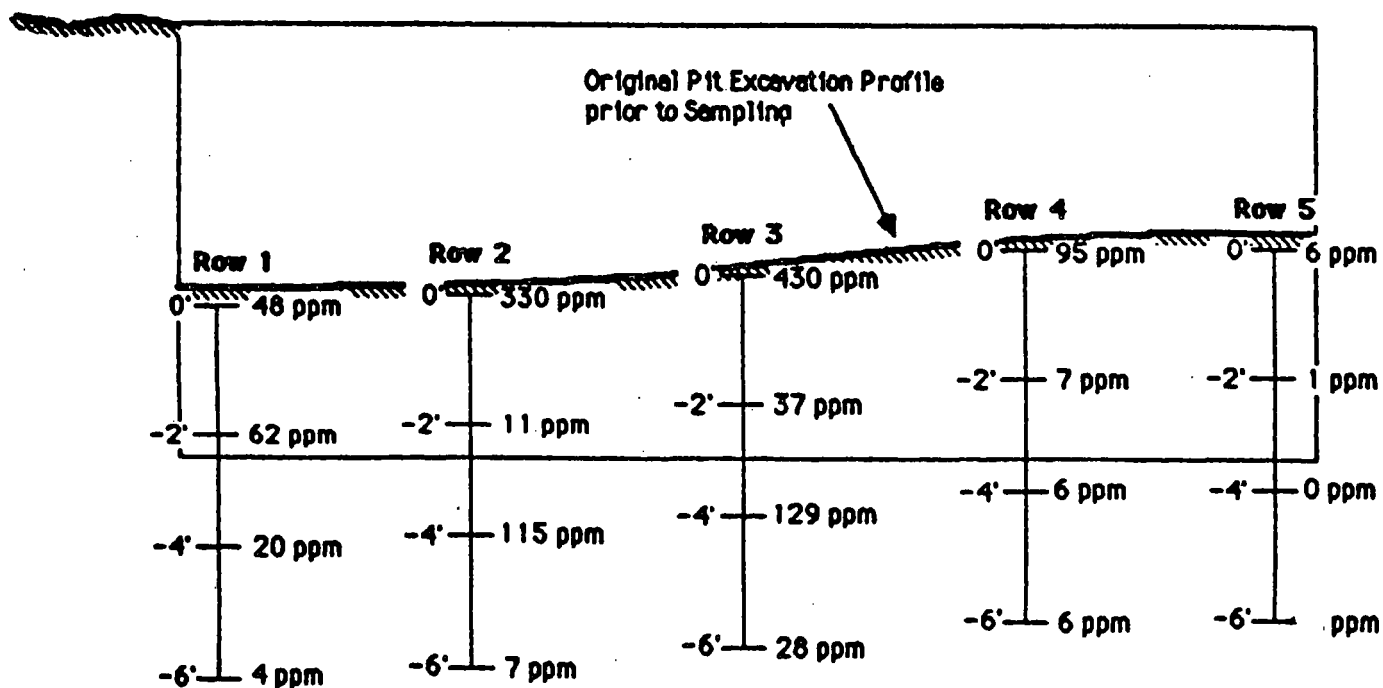
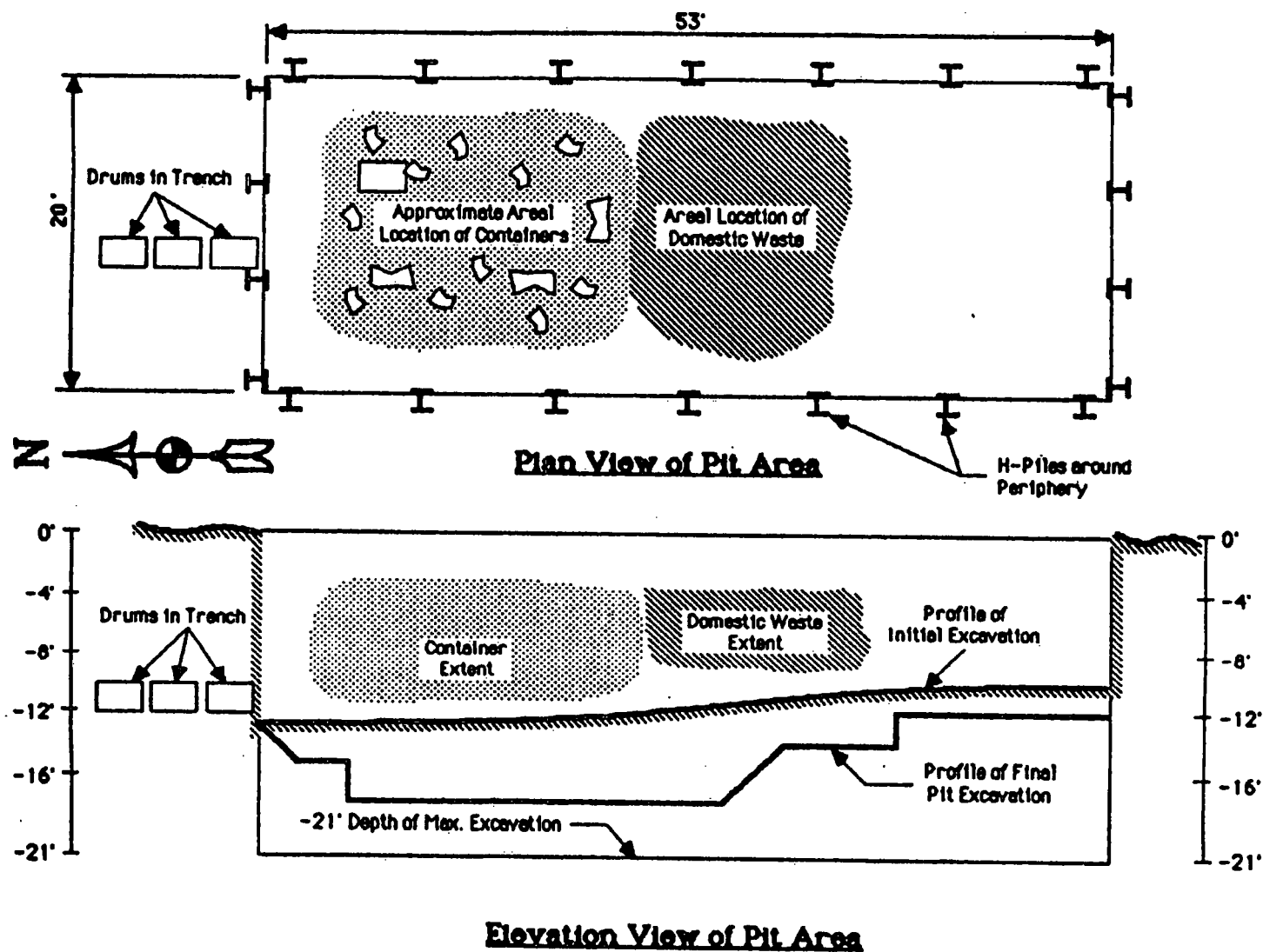
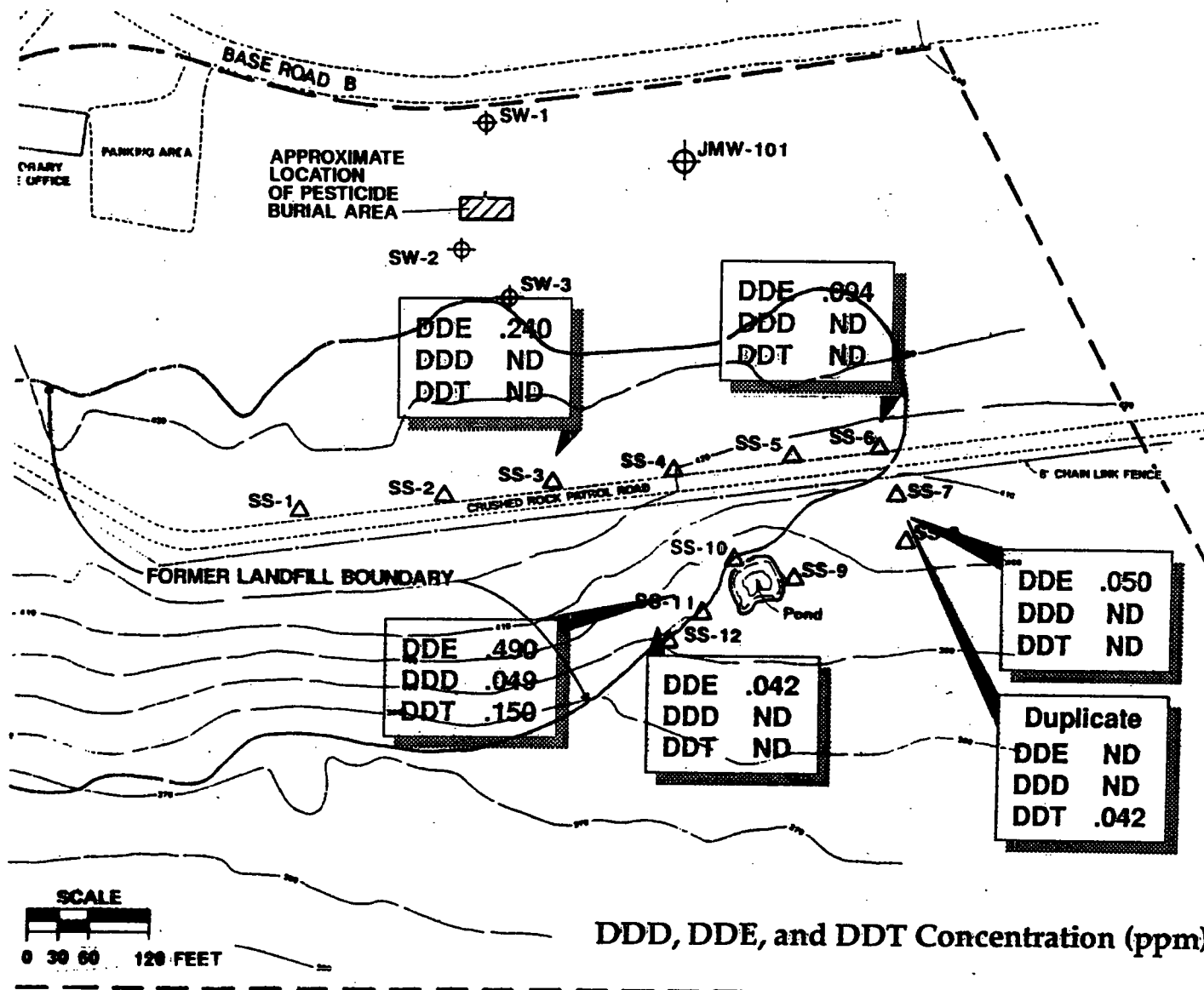


Figure 3: Plan and Elevation Drawing of Pit



PPBA Soil Sampling Results



IV. PESTICIDE PIT BURIAL AREA - PLANS FOR REMEDIAL INVESTIGATION

- **SURFACE INVESTIGATION**

- **SURFACE SOIL**

- **SUBSURFACE INVESTIGATION**

- **MONITORING WELLS**
 - **PIEZOMETERS**

PPBA Soil Sampling Results

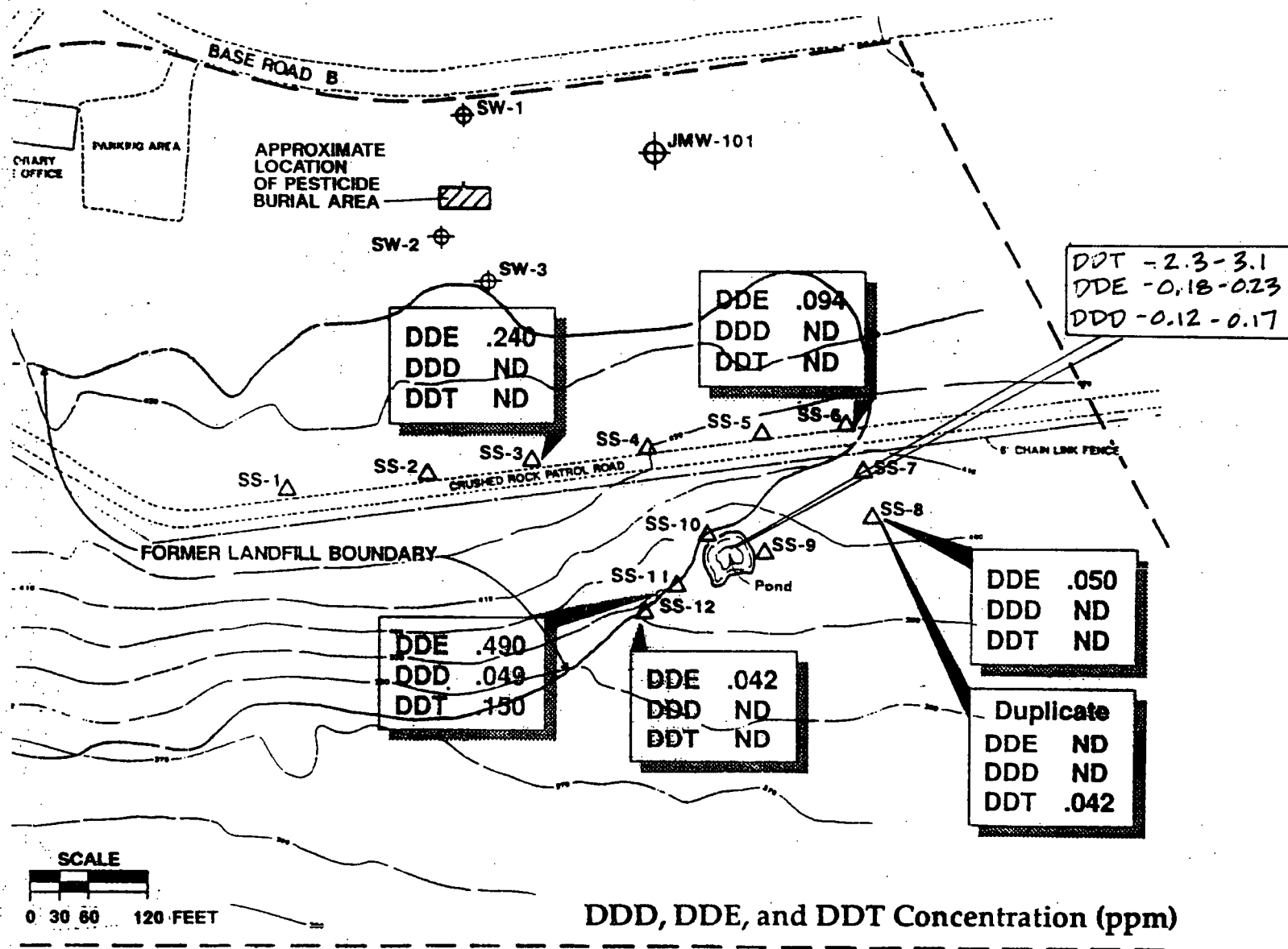


TABLE 1

SANG-RES

18-Apr-91

TARGET CONCENTRATION OF CONCERN DETERMINATION

FUTURE RESIDENTIAL EXPOSURE OF AN ADULT TO SURFACE SOIL VIA DIRECT CONTACT AND INCIDENTAL INGESTION

PESTICIDE BURIAL PIT

STEWART AIR NATIONAL GUARD BASE

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE	RATIONALE
INGESTION RATE	IR	100	mg/day	USEPA, 1989	Recommended soil ingestion rate for an adult
FRACTION INGESTED	FI	100%		ASSUMPTION	Conservative estimate
ADHERENCE FACTOR	AF	1.45	mg/cm ²	USEPA, 1989	Recommended soil-skin adherence factor
SURFACE AREA EXPOSED	SA	3,120	cm ² /day	USEPA, 1989	Surface area of adult hands and arms
FRACTION CONTACTED	FC	100%		ASSUMPTION	Conservative estimate
BODY WEIGHT	BW	70	kg	USEPA, 1989	Average body weight of adults
EXPOSURE FREQUENCY	EF	104	days/year	ASSUMPTION	Exposure for 2 days/week, 52 weeks/year
EXPOSURE DURATION	ED	30	years	USEPA, 1989	90th percentile for length of residence at one location
AVERAGING TIME	AT	70	years	USEPA, 1989	Consensus estimate of life expectancy

USEPA, 1989. Risk Assessment Guidance for Superfund

TABLE 2

TARGET CONCENTRATION OF CONCERN DETERMINATION

FUTURE RESIDENTIAL EXPOSURE OF A SMALL CHILD TO SURFACE SOIL VIA DIRECT CONTACT AND INCIDENTAL INGESTION

PESTICIDE BURIAL PIT

STEWART AIR NATIONAL GUARD BASE

SANG-CHD

18-Apr-91

EXPOSURE PARAMETERS

PARAMETER	SYMBOL	VALUE	UNITS	SOURCE	RATIONALE
INGESTION RATE	IR	200	mg/day	USEPA, 1989	Recommended soil ingestion rate for a child 1-6 years
FRACTION INGESTED	FI	100%		ASSUMPTION	Conservative estimate
ADHERENCE FACTOR	AF	1.45	mg/cm ²	USEPA, 1989	Recommended soil-skin adherence factor
SURFACE AREA EXPOSED	SA	3,160	cm ² /day	USEPA, 1989	Surface area of 1-6 year child: hands, arms and legs
FRACTION CONTACTED	FC	100%		ASSUMPTION	Conservative estimate
BODY WEIGHT	BW	16	kg	USEPA, 1989	Average body weight of children 1 to 6 years
EXPOSURE FREQUENCY	EF	365	days/year	ASSUMPTION	Exposure every day
EXPOSURE DURATION	ED	6	years	USEPA, 1989	Child 1 to 6 years
AVERAGING TIME	AT	70	years	USEPA, 1989	Consensus estimate of life expectancy

USEPA, 1989. Risk Assessment Guidance for Superfund

TARGET CONCENTRATION OF CONCERN DETERMINATION
ESTIMATED CANCER RISKS FOR HUMAN RECEPTORS
PESTICIDE BURIAL SITE
STEWART AIR NATIONAL GUARD BASE

EXPOSED POPULATION	TARGET DETECTION LIMIT DDT/DDD/DDE mg/kg		
	1	5	10
ADULT	8E-07	4E-06	8E-06
CHILD	3E-06	1E-05	3E-05
WORKER	1E-06	5E-06	1E-05

ACCEPTABLE RISK: 1E-04 TO 1E-06

Risks reflect the sum of individual risks of each pesticide at the indicated detection limit.

TARGET CONCENTRATION OF CONCERN DETERMINATION
ESTIMATED HAZARD INDICES FOR HUMAN RECEPTORS
PESTICIDE BURIAL SITE
STEWART AIR NATIONAL GUARD BASE

EXPOSED POPULATION	TARGET DETECTION LIMIT DDT/DDD/DDE mg/kg		
	1	5	10
ADULT	0.01	0.07	0.1
CHILD	0.3	1	3
WORKER	0.01	0.07	0.1

ACCEPTABLE HAZARD INDEX: 1.0


Risks reflect the sum of individual risks of each pesticide at the indicated detection limit.

TARGET CONCENTRATION OF CONCERN DETERMINATION
ESTIMATED HAZARD INDICES FOR ECOLOGICAL RECEPTORS
PESTICIDE BURIAL SITE
STEWART AIR NATIONAL GUARD BASE

ECOLOGICAL RECEPTOR	TARGET DETECTION LIMIT * DDT/DDD/DDE (mg/kg)		
	1	5	10
White-Footed Mouse	0.15	0.77	1.5
Wood Thrush	0.13	0.63	1.3
Garter Snake	0.021	0.11	0.21
Red Fox	0.00068	0.0034	0.0068
Red-Tailed Hawk	0.00027	0.0013	0.0027

ACCEPTABLE HAZARD INDEX (USEPA, 1986):

< 0.1	No Adverse Effects
0.1 - 10	Possible Adverse Effects
> 10	Probable Adverse Effects

 = Possible Adverse Effects to Individual Organisms

 = Increased Probability of Significant Ecological Effects

* Risks reflect the sum of individual risks of each pesticide at the indicated detection limit.

DDT (total) threshold of concern action level = 5 mg/kg (part per million). This action level is based on risk evaluation of existing data, which suggests that the following levels are acceptable:

- 10 mg/kg - human population**
 - 5 mg/kg - other ecological receptors**
-

MONITORING WELL EXPLORATIONS (1)

- **Objective** - evaluate the distribution of DDT in subsurface soil at selected locations upgradient and downgradient of the pit, and provide data through monitoring well installation and sampling to evaluate the distribution of contaminants in groundwater.
- **Applicability** - Collection and GC screening of subsurface soil samples obtained from the monitoring well borings will provide data for evaluation of new, permanent well locations and placement of well screens.

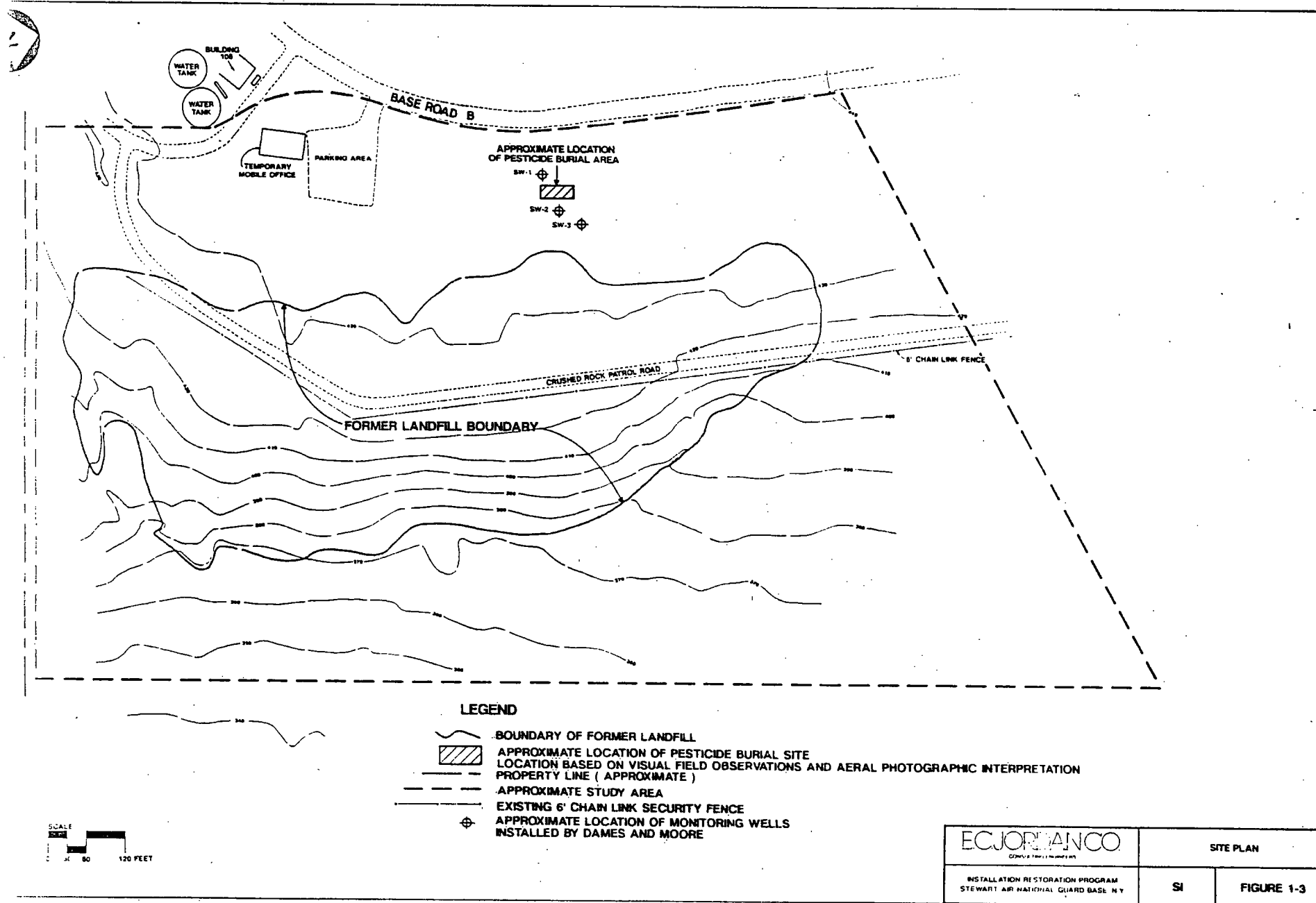
MONITORING WELL EXPLORATIONS (2)

→ **Coverage** - Monitoring well pairs consist of one overburden well and one well screening the bedrock and fractured bedrock zone. Locations of new monitoring wells are:

- One well pair located upgradient of the pesticide pit.
- Two well pairs installed east of the pesticide pit and the Dames and Moore wells.

Final locations of the downgradient well pairs to be determined by GC screening results in the deeper monitoring well boring at each location. To select the optimal well pair locations, two additional deep borings with no well installation may be drilled and sampled.

→ **Method** - Monitoring well borings will be drilled by and sampled through 4.25-inch ID hollow-stem augers. Stainless steel monitoring wells will be installed through the hollow-stem augers. Subsurface samples will be obtained with split spoon samplers.



PIEZOMETERS

- **Objective** - To evaluate the vertical and horizontal gradients of the uppermost potentiometric surface in the vicinity of the pesticide pit.
- **Applicability** - It is not known if a saturated condition exists in the upper till unit because existing and proposed monitoring wells screen only deep till and upper bedrock zones. The piezometers will be installed in the upper basal till and weathered till units.
- **Coverage** - Two 3/4-inch ID piezometers, installed with 10-foot screens from 5 to 15 feet below ground surface will provide data to assess the top of the saturated zone in the weathered till. Piezometers will be located upgradient and downgradient of the pesticide pit.
- **Method** - Piezometers will be installed through 3.25-inch ID hollow stem augers at locations where the soil has been undisturbed by previous explorations or excavations.